Vol. 14 OCTOBER–NOVEMBER, 1925 Nos. 10–11

ENTRIES 8196–9686

Dorsey

BOTANICAL ABSTRACTS

PUBLISHED MONTHLY UNDER THE DIRECTION OF

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THE BOARD OF CONTROL OF BOTANICAL ABSTRACTS, INC.,

by

THE WILLIAMS & WILKINS COMPANY

MT. ROYAL AND GUILFORD AVENUES

BALTIMORE, U. S. A.

Entered as second-class matter, November 9, 1918, at the post-office at Baltimore, Maryland, under the Act of March 3, 1879

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FOR EDITORIAL AND BUSINESS NOTICES, SEE THIRD COVER PAGE

CONTENTS

Agronomy (Crops and Soils) 8196–8381
Bibliography, Biography and History 8382–8405
Botanical Education 8406–8422
Cytology 8423–8436
Ecology and Plant Geography 8437–8508
Forestry Botany and Forestry 8509–8715
Genetics 8716–8796
Horticulture 8797–8917
Morphology, Anatomy and Histology of Vascular Plants 8918–8941
Morphology and Taxonomy of Algae 8942–8982
Morphology and Taxonomy of Bryophytes 8983–8996
Morphology and Taxonomy of Fungi, Lichens, Bacteria and Myxomycetes 8997–9066
Paleobotany and Evolutionary History 9067–9084
Pathology 9085–9304
Pharmaceutical Botany and Pharmacognosy 9305–9341
Physiology 9342–9569
Taxonomy of Vascular Plants 9570–9674
Miscellaneous, Unclassified Publications 9675–9686

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AGRONOMY (CROPS AND SOILS)

C. V. Piper, *Editor*
Mary R. Burr, *Associate Editor* (*Crops*)
T. D. Rice, *Associate Editor* (*Soils*)

(See also in this issue Entries 8391, 8395, 8421, 8437, 8438, 8447, 8457, 8478, 8479, 8501, 8521, 8535, 8554, 8589, 8596, 8683, 8713, 8716, 8735, 8736, 8737, 8750, 8754, 8758, 8768, 8769, 8771, 8775, 8781, 8784, 8790, 8921, 8947, 9087, 9103, 9113, 9132, 9153, 9211, 9224, 9282, 9288, 9302, 9303, 9313, 9340, 9364, 9375, 9387, 9392, 9407, 9425, 9452, 9489, 9503, 9515, 9535, 9542, 9548, 9561)

CROP SCIENCE (ARVICULTURE)

8196. Anonymous. **Die Sonneblume. [The sunflower.]** Tropenpflanzer 24: 21–22. 1924.—Hungary and especially Rumania and southern Russia are well suited for growing the sunflower. It requires a total growing heat of 2500 to 2800°C. A loose, limy, moist, loamy soil is preferred. When sown in Central Europe in April, seed can be harvested from the end of September until October. The heads are cut off when the seed are not quite hard.—*J. C. Th. Uphof.*

8197. Anonymous. **Ein Institut für Tabakbau in Greichenland. [An institution of tobacco growing in Greece.]** Tropenpflanzer 27: 24–25. 1924.—In Drama, Greece, an institution is being erected for breeding and other investigations of tobacco. It will follow the system used by a similar institution in Scafati, Italy.—*J. C. Th. Uphof.*

8198. Anonymous. **Green manuring.** South African Sugar Jour. 9: 153. 1925.—One of the most remarkable green manuring crops is the sunn hemp (*Crotalaria juncea*), recently introduced into southeast Africa and growing in Kynoch's experimental plots at Umbogintwini. When grown as a green manure it should be plowed in when about 2 to 3 feet high, or while the stalks are tender, as, being of a fibrous nature, it would be rather too coarse for plowing in successfully when full grown.—*Nellie E. Fealy.*

8199. Anonymous. **Indian sugar nomenclature.** Internat. Sugar Jour. 27: 126. 1925. —"Gur" and "Jaggery," are synonymous in India, both meaning boiled juice, usually with a little lime or other substance to enable it to keep better during the rains. Gur is the vernacular that has outclassed all the others in northern India, while jaggery has done the same in southern India and Ceylon. These terms refer to the product of sugar cane, and also to palm sugar. Whether gur or jaggery can be properly classified as raw sugar is perhaps a matter of opinion. They have little that is analogous with muscovada. Gur has much more flavor in it than sugar should have and is what the Indian wants as food. In India there are a vast number of different preparations of the sugar of cane juice, varying from the "dirtiest mess" to the most beautiful crystals. Rab is a sort of low-grade, raw sugar in which boiling is not carried so far as in jaggery, and, an effort being made to drain off the non-crystallizable elements, it is more on a par with muscovada. When completely washed Rab becomes khand, and by further purification a number of different forms are produced from the khand, such as misri, kuza khand, chini, etc., the kuza khand being the best quality of all and equivalent to our "sugar candy." The gurs or jaggeries differ very widely in different parts of India.—*Nellie E. Fealy.*

8200. Anonymous. **Machine for fighting cane fires.** Australian Sugar Jour. **17**: 54. 1925.—The apparatus, constructed on the theory that a small quantity of water delivered under high pressure is as effective in extinguishing fires as a heavy solid stream delivered under low pressure, is described in detail. Tried out under conditions as nearly as possible analogous to cane fires the apparatus "proved eminently successful."—*Nellie E. Fealy.*

8201. Anonymous. **New version of Uba's origin.** South African Sugar Jour. **9**: 155. 1925.—The story is that Medley Wood, curator of the Botanic Gardens, Durban, found a bag containing plant cane in a shed at the Point and planted it. On the bag was a torn label on which there were 3 letters (uba) of a word, the others having been obliterated. The complete word was said to be Jubalpore, the name of the district in which the cane originated. When the planted cane came to maturity Mr. Wood secured a number of sticks, which he planted, and these produced the Uba cane of the Natal sugar industry.—*Nellie E. Fealy.*

8202. Anonymous. **Sisal hemp plantations on the Gold Coast.** Bull. Imp. Inst. **21**: 497–499. 1923.—To establish a new industry in a section not adapted to the growth of cocoa and oil palm 1000 acres of sisal has been planted by the government. It is hoped that the crop will be largely adopted by the farmers in the surrounding area.—*L. A. Kenoyer.*

8203. Anonymous. **State experiment farms. What the state is doing to help the farmer.** Jour. Dept. Agric. Western Australia 2nd. Ser. **1**: 426–440. *9 fig.* 1924.—The experiments carried on at Merredin are described, and the season's results given. Among the projects covered are identification and testing of wheat, oats, and barley varieties, wheat and oats breeding, smut treatment and smut resistance tests, dates of fallowing, depth of plowing, dates and rates of sowing, and rates of superphosphate application.—*P. J. Olson.*

8204. Anonymous. **The Queensland canes.** South African Sugar Jour. **9**: 197. 1925.—Queensland canes growing in the experimental plots at Mt. Edgecombe are Badila, which originated in New Guinea, a deep-rooting purple cane giving a very high sucrose content when mature; 1900 Seedling, produced in Queensland, having a sucrose content nearly as good as Badila and under suitable conditions giving 40 tons to the ace; D1135, of Demerara origin, a hardy, frost-resisting variety which has the reputation that Uba has for ratooning well, with a sucrose content believed to be higher on an average than Uba; HQ694, a seedling of Queensland origin, said to be very drought-resistant and with a high sucrose content; Clark's Seedling, produced in Queensland, with low fiber and high sucrose content, a good soft variety but not adapted to dry-weather conditions and therefore unsuitable for irrigated lands; Gingor, a comparatively new variety, said to have a very high sucrose content; Q813, a self-thrashing variety for good lands, but requiring some time to become established; and M189, originally from Mauritius, a hardy variety with high sucrose content.—*Nellie E. Fealy.*

8205. Anonymous. **World wheat production.** Nature **115**: 443–444. 1925.—The writer finds the situation reassuring, as shown by the International Year book of Agricultural Statistics for 1923.—*O. A. Stevens.*

8206. Anonymous. **Zpráva o činnosti moravského zem. výzkumného ústavu zemědělského v Brně. [Rept. Moravian Agric. Exp. Sta. Brno] 1923: 1–171.** *1 pl.* 1924.—The Agricultural Experiment Station in Brno is divided into 8 sections: (1) The section of agropedology and agrometeorology is reported as very active in organizing agrometeorological work in Moravia by establishing meteorological stations and by collecting phenological data. Research was carried on to determine the colloidal properties of soils. This section was active in analyzing soils from different parts of Moravia and mapping Moravian soils.—(2) The section of biochemistry has carried on experiments with different fertilizers and made control analyses of commercial fertilizers and feeding products.—(3) The section of agrobotany has charge of seed testing work and also has carried on varietal tests.—(4) The section of plant breeding is breeding rye, oats, barley, wheat, potatoes and grasses.—(5) The section of systematic botany and breeding of medical plants and basket willows has been experimenting with 110 different medical plants and propaganda was carried on for their cultivation. The report gives an extensive list of different species of willows which were planted in experimental fields located in different parts of the province.—(6) The section of phytopathology during the year 1923 established a laboratory of applied entomology; studied diseases of clover and potatoes and experimented with different chemicals used in treatment of cereals against smuts. (7) The section of viticulture and horticulture carried on experiments with manure on grape and other fruits, experimented with different strains of yeast, studied diseases of the vine and made control-analyses of wine.—*M. Demerec.*

8207. Aartsen, J. P. van. **De land-en tuinbouw in het Departement Tarn-et-Garonne in Z. W. Franrijk. [Agriculture and horticulture in the Department of Tarn-et-Garonne in southwestern France.]** Landbouwk. Tijdschr. 37: 65–72, 96–107. 1925.—The most fertile soils are put into meadows where often species of cottonwood are planted, especially *Populus angustata* but sometimes also *P. pyramidalis* and *P. monilifera*. The future cottonwood meadow is plowed deeply, and the trees are planted 30 m. apart. After 3 or 4 years grass seed is planted. West of Moissac where the soil is very fertile, d'Agen prunes are extensively grown. The growing of wheat, grapes and other agricultural and horticultural products is described.—*J. C. Th. Uphof.*

8208. Adams, A. B. **Clover hay. Reasons for its more extensive use, and hints on making.** Jour. Dept. Agric. Western Australia 2nd. Ser. 1: 304–306. 1924.—A popular discussion. —*P. J. Olson.*

8209. Adams, A. B. **Subterranean clover.** Jour. Dept. Agric. Western Australia 2nd Ser. 1: 514–518. *3 fig.* 1924.—Three varieties of subterranean clover are described: (1) an early, (2) a midseason and (3) a late flowering variety. Suggestions are offered for establishing and maintaining the crop.—*P. J. Olson.*

8210. Alexander, R. E. **Cropping and nitrogen exhaustion.** Canterbury [New Zealand] Agric. Coll. Mag. 4: 535–537. 1918.—In estimating the true cost of producing a crop, due consideration should be given to the toll which that crop levies on the plant foods in the soil. Examples are given of crops exhausting and of crops increasing the nitrogen supply.—*H. H. Allan.*

8211. Alexander, R. E. **Green feed for sheep.** Canterbury [New Zealand] Agric. Coll. Mag. 4: 597–599. 1919.—The relative values of Thousand Head kale, Cape barley, oats, Emerald rye and Italian rye-grass, for Canterbury soils, are estimated.—*H. H. Allan.*

8212. A[lexander], R. E. **Management of pastures.** Canterbury [New Zealand] Agric. Coll. Mag. 5: 6–9. 1924.—A summary is given of the general principles governing the management of pastures, emphasis being laid on the value of liming, alternating, and harrowing in the spring.—*H. H. Allan.*

8213. Alexander, R. E. **The vetch or tare as a farm crop.** Canterbury [New Zealand] Agric. Coll. Mag. 4: 776–779. 1921.—Vetch and oats mixed is considered one of the most remunerative crops grown on the College farm.—*H. H. Allan.*

8214. Appleton, H. C. **Napier grass.** Georgia State Coll. Agric. Circ. 101. *1–4.* 1924. —For the past 2 winters Napier grass (*Pennisetum purpureum*) has withstood the cold in Georgia. If it continues to be resistant it may be a grass of value in this state.—*T. H. McHatton.*

8215. Barnette, R. M. **Pot and field experiments with common salt 1920–1921.** Jour. Amer. Soc. Agron. 17: 125–129. 1925.—From pot and field experiments it is concluded that under certain conditions common salt may be a proper amendment to certain fertilizers. However, the cost and time necessary for the application of salt would offset any small increases to be expected from its application.—*F. M. Schertz.*

8216. Barr, J. E. **Delinting and recleaning cottonseed for planting purposes.** U. S. Dept. Agric. Dept. Bull. 1219. *1–19. Pl. 1–8, fig. 1–8.* 1924.—Cotton seed used for planting should be both delinted closely and recleaned efficiently to obtain best results. These processes are interdependent and recleaning cannot be done economically or efficiently unless the seed are first delinted. The conclusions reached are the result of extensive studies and numerous experiments made to determine the effect of delinting at varying rates of cut on the percentage of seed injured by delinter saws, the appearance of the seed, germination, planting capacity, and weight per bushel or volume of 30 pounds in terms of a bushel. Analyses were also made of a number of samples to determine the degree of success with which cotton seed is now being recleaned and the factors affecting the efficient operation of recleaning machines, special attention being given to delinting as such a factor. The rate of delinting, or quantity of linters removed per ton of seed is the basis for measuring the effectiveness of the delinting operation. Removal of the linters from ginned cotton seed reduces the volume per unit of weight and increases the weight per measured bushel, the volume per unit being affected inversely as the weight per bushel, and the volume decreasing slightly less rapidly than the weight increases. The average lot of ginned cotton seed that has been recleaned contains practically the same percentage of lightweight seed as before recleaning. Delinting only partially recleans the seed in so far as the inert matter is concerned and does not eliminate the lightweight, immature seed; however, it facilitates recleaning. Much of the cotton seed cleaned out of ginned seed is just as good as the original lot and is unnecessarily lost. Removing the surplus linters from these seed by delinting before attempting to reclean them makes it possible to reclean and grade the seed with a minimum loss of good seed. The net increase in the cost of delinting and recleaning is more than offset by the increased number of good seed and consequent greater planting capacity per unit of weight.—*Author.*

8217. Bentley, F. L. **The ever necessary root crops.** Field Illus. 35^3: 18–19. *1 fig.* 1925.—A popular discussion of the importance of root crops in the cooler northern regions, their culture and storage and the relative feeding merits of the various kinds.—*H. O. Werner.*

8218. Bois, D., et J. Gerome. **Culture dérobée de la pomme de terre avec des semences venant d'Algérie (nouvel essai fait en 1923). [Extra-seasonal cultivation of the potato.]** Bull. Mus. Hist. Nat. [Paris] 29: 629. 1923.—This is a brief account of a new attempt, made in 1923, to raise a late crop of potatoes from seed-pieces received from Algeria July 19. Ten tubers, with an aggregate weight of 450 gm. were planted immediately upon arrival at the Paris station and were harvested 4 months later, with a yield of 62 tubers totalling 1560 gm. The plants averaged 6 tubers each; these were small and not utilizable. The results are considered negative and the method one that cannot be recommended for the Paris region.—*John M. Fogg, Jr.*

8219. Bois, D., et J. Gerome. **Les meilleures variétés de Soja pour la région parisienne. [The best varieties of soybean for the Paris region.]** Bull. Mus. Hist. Nat. [Paris] 29: 626–628. 1923.—Twenty-three varieties of *Soja hispida,* received from the U. S. A. Dept. of Agric., were grown and their yields compared with those of standard European varieties. These experiments were carried on over a series of 3 years on land of the Muséum d'Histoire Naturelle (Paris). In 1921, 7 American and 6 European varieties ripened their seed, and in 1922, 2 American and 4 European varieties did likewise. In 1923—a very unfavorable season—the best varieties of the 2 preceding years were tested. These results are completely tabulated by the authors. The general conclusions are that (1) the most rapid growing varieties are the most satisfactory, (2) the black-seeded varieties give the finest yield, and (3) the European varieties are better adapted to regional conditions than are the American.—*John M. Fogg, Jr.*

8220. Botha, C. Graham. **Note on early veld burning in the Cape Colony.** South African Jour. Sci. 21: 351–352. 1924.—In 1687 a law was passed imposing the severest penalties for the contravention of the law against veld burning. This law had not become a dead letter in 1848, and it is quite a reasonable question to ask whether it is still in force.—*E. M. Doidge.*

8221. Bukasov, S. M. **American potato varieties in Russia.** Proc. 11th Ann. Meeting Potato Assoc. America 1924: 121–122. 1925.—A collection of some 150 varieties of potatoes from the U. S. A. and Canada was brought together by D. N. Borodin, Director of the Russian

Agricultural Bureau, with headquarters in New York City. These were forwarded to Leningrad, Russia, in the early autumn of 1922 and provide the basis for this paper. In 1923 there was a marked development of virus diseases in the vicinity of Leningrad, half of the American varieties being found to be more or less affected. The groups observed to be most free were Cobbler and Rose. In 1924 the number of diseased plants was greatly increased. The principal disease was mosaic. A severe epidemic of scab occurred in 1924, but the Russet Burbank proved almost immune. The most susceptible to scab was the Early Eureka of the Early Michigan group. Green Mountain, Early Ohio, Irish Cobbler, Triumph, and Early Rose, including Spaulding Rose, were less seriously affected. Early Rose is mentioned as the leading early variety, Richter Imperator as the main crop variety, and Wohlmann for late crop. The Irish Cobbler, Triumph and perhaps Spaulding Rose are thought to have some promise for north European, Russian and American main crop varieties for southern Russia.—*W. Stuart.*

8222. Bushnell, John. **Effect of fertilizers on number and size of potato tubers.** Proc. 11th Ann. Meeting Potato Assoc. America **1924**: 108–113. 1925.—The data presented in this paper were obtained in 1924 from the Russet Rural potato planted June 13 on a long time fertilizer experimental plot begun in 1893 at the Ohio Agric. Exp. Sta., in which the potato is included in a 3-year rotation with wheat and clover. Increases in yield from nitrate of soda were small, but a large increase was obtained from potash. Application of phosphate did not give any appreciable increase. The effect of fertilizer on number and size of tubers is summarized by the author as follows: Nitrate increased the number of tubers per plant, but had no appreciable effect on the size of the tuber; potash had a marked effect in increasing the size of tubers but no consistent influence on the number; phosphate had no effect on number and comparatively little effect on size of tubers.—*W. Stuart.*

8223. Busse, W. **Die Gewinnung von turkischen Tabak in den Tropen. [Growing Turkish tobacco in the tropics.]** Tropenpflanzer **25**: 43–48. 1922.—In Besoeki (Eastern Java) different varieties of tobacco from European and Asiatic Turkey have been tested. The plants developed in the new climate were vigorous, although the leaves lost certain properties which made them of less value than the real Turkish tobacco. On account of weather conditions in Besoeki, proper drying was difficult and the yellow color desired could not be obtained. Turkish tobacco yields a small harvest and requires much labor. The variety Reveni Almyro from Greece is not uniform and requires a rich soil. The writer questions whether along the equatorial zone as good a product with the well known character of the Turkish can be produced as in subtropical regions like South Africa. On the other hand the yellow tobacco produced extensively in British Nyassaland from American bright tobacco possesses characteristics other than those of the oriental varieties. Along the equatorial zone, Turkish tobacco should be grown at higher altitudes, in order to get a climate similar to that of the Mediterranean. In East Africa it should not be grown below 1200 m. altitude. During fermentation the temperature should not be higher than 40°C. In Turkey this tobacco is grown in a porous, sandy soil poor in humus. Manuring has to be done carefully. In the Xanthi District of Turkey tobacco is grown on the same field for 6 or 7 years, after which the land is fertilized with stable manure, seeded for 1 year with wheat, and again planted to tobacco.—*J. C. Th. Uphof.*

8224. Busse, W. **Luzerne in Turkestan. [Alfalfa in Turkestan.]** Tropenpflanzer **28**: 11–25. 1925.—Alfalfa has been grown in Turkestan for over 2000 years yet little is known of the industry except in Russian Turkestan. The entire region has a dry continental climate with a high summer temperature and a short but cold winter. On account of the light rainfall irrigation is necessary, methods varying according to topography. The number of irrigations depends upon the locality. Near the city of Samark the alfalfa is irrigated in the spring, again when the crop is 30 cm. high and once after every cutting. In the spring irrigation must not be too early or weeds will dominate. The water is derived from some of the large rivers which rise in the higher mountains. The maximum rainfall occurs in March or April; the minimum from July to August or September. The relative humidity of the air varies considerably. Different soils are described, the most valuable being a kind of loess which requires special treatment. Alfalfa is grown in rotation either with field or garden crops. In the Province of Samarkand there are 21,000 desjatines in alfalfa (1 desj. = 1.09 ha.). In the Province of Syr-Darja fields are kept 7 to 8 or sometimes 10 years, or even 12 years near Taschkent. The first 2 years produce little harvest. The fields are fertilized with stable manure or with loess derived from the walls of old buildings. Sheep are sometimes pastured on the alfalfa but not the larger animals; 3 to 4 or rarely 5 cuttings per year are obtained except near the capital where 5 to 6 may be taken.—*J. C. Th. Uphof.*

8225. Carne, W. M., and C. A. Gardner. **Two species of wild oat.** Jour. Dept. Agric. Western Australia 2nd Ser. 1: 484–487. *2 fig.* 1924.—The "Yatheroo" or "Bearded Oat" (*Avena barbata*) is described and contrasted with common "Wild' or "Black Oat" (*Avena fatua*). This oat is highly esteemed by farmers as a hay plant, and is not a weed in crops. —*P. J. Olson.*

8226. Cheel, E., and R. H. Anderson. **Weeds common in New South Wales. Common heliotrope (Heliotropium europaeum).** Agric. Gaz. New South Wales 36: 280. *1 fig.* 1925.—This plant is illustrated and suggestions are given for its control. It is said to be native to Australia.—*L. R. Waldron.*

8227. Chevalier, A. **Les petites céréales. [The lesser cereals.]** Rev. Bot. Appl. et Agric. Coloniale 2: 544–550. 1922.—The term, "petites céréales" is used by the author for certain members of the grass family other than the common grains, which, either wild or cultivated, have been used as food by man. During famines the fruit of the bamboo is eaten in India; in Africa the natives eat large quantities of small, wild cereals. In the Sahara the seed of *Panicum turgidum* deposited in the sand by ants, is eaten by man. In the basin of the Tchad the seed of *Panicum Kotschyanum, Eleusine indica, Dactyloctenium aegyptiacum* and species of *Digitaria* and *Setaria*, are eaten. *Panicum crus-galli* and *P. colonum* are used as food in tropical Asia, and in Europe the seed of *Digitaria sanguinalis* is used in breadmaking; it is suggested that the latter species may have been one of the small grains earliest cultivated during the Neolithic Age. The Indians of Peru make the seed of *Milium paradox* into flour and beer.—The following 12 species of lesser cereals are also briefly discussed: *Penicillaria spicata, Setaria italica, Phalaris canariensis, Panicum miliaceum, P. frumentaceum, P. esculentum, Paspalum scrobiculatum, Digitaria exilis, Eragrostis abyssinica, Eleusine coracana,* and *Coix Lacryma-Jobi* var. *Ma-Yuen.*—*Frederick V. Rand.*

8228. Clatworthy, J. **The growing of fodder crops in the wheat belt.** Agric. Gaz. New South Wales 36: 326–331. 1925.—The 2 crops discussed are alfalfa and oats.—*L. R. Waldron.*

8229. Clifton, A. R. C. **Tobacco growing and curing.** Jour. Dept. Agric. Western Australia 2nd Ser. 1: 266–269. 1924.—A trial was carried out in which several varieties were grown at a number of different places. Each variety was grown on a $\frac{1}{40}$-acre plot. The results were very unsatisfactory from the yield standpoint, owing to the very dry season. The quality of the product, however, was good. Instructions for curing the leaf are given. A list of the materials and detailed plans and specifications for the construction of a curing barn are appended.—*P. J. Olson.*

8230. Cole, John S., and A. L. Hallsted. **Methods of winter-wheat production at the Fort Hays Branch Station.** U. S. Dept. Agric. Dept. Bull. 1094. *1–31. Illus.* 1922.—From statistics for the 47 years from 1874 to 1920 published in the Biennial Reports of the Kansas State Board of Agriculture it is shown that for 30 years nearly 75% of the cultivated acreage in the area represented by the Hays Station has been devoted to winter wheat. It is also shown that there has been no progressive change in yields during this period. Experiments in methods of winter wheat production were started at the Hays Station in 1906 and have been continuous. The results are given of continuous cropping to wheat in alternation with fallow; continuous cropping with early plowing, late plowing, subsoiling, and listing; continuous cropping without plowing, and with plowing omitted from 1 to 3 years; growing wheat in intertilled strips; using green manures in rotations; the relative effects of corn and kafir on following crops of wheat; the relative effect of kafir on winter wheat and on spring barley; fallowing by different methods for winter wheat; and using manure and straw in rotations of fallow, kafir, and wheat. The authors conclude that without reducing the proportion of wheat to other crops, an increase of 50% in the present average yield per acre is not impossible, and that some part of it should be realized through greater timeliness and efficiency of operations.—*John S. Cole.*

8231. Cross, William E. **Some notes on cane variety work in Tucumán, Argentina.** Internat. Sugar Jour. 27: 199–204. 1925.—The deterioration of the native canes of Tucumán, on account of the mosaic disease, and the efforts made to restore the decreasing yields, beginning about 1890, and including introduction of numerous varieties from other countries, establishment of the Experiment Station, and testing of these varieties, are briefly reviewed. The varieties tested at the station included a practically complete collection of those then growing at the Louisiana Experiment Station, a large collection obtained by the National School of Agriculture in Tucumán, and 6 of the seedling varieties produced by Kobus in Java. Out of the large number of varieties tested 2 "turned out to be excellent canes from every point of view." These were the Java varieties POJ 36 and 213. "They produced very high yields of cane per acre—more than double those of the 'native' canes—and were of satisfactory sugar content, the POJ 213 being early maturing. They were also resistant to diseases, including the mosaic disease, and to adverse conditions in general, and were hardly attacked at all by the cane borer, a very serious pest with the purple and striped varieties. They were canes which could be carried to many years of stubble with satisfactory results, neither the standing cane nor the stubbles after cutting suffering appreciably from any but the most intense frosts. Their fiber content was higher than the 'native' canes. . . . The experiment station was thus able to recommend these canes most unreservedly to the planters, and in 1916 and 1917 the industry decided to adopt them in the place of the then extremely degenerate purple and striped varieties." The years 1917 to 1919 were the trial years for these varieties and confirmed in every way the conclusions of the Experiment Station, with the result that they have been planted in Tucumán almost exclusively ever since. Notes are given on the origin, characteristics, etc., of a number of imported varieties tested at the Station. Plans for the establishment of 2 or 3 isolated nurseries from which the Experiment Station can supply the planters with mosaic-free seed are under consideration.—*Nellie E. Fealy.*

8232. Dean, Daniel. **Crop rotation to increase potato yield.** Proc. 11th Ann. Meeting Potato Assoc. America 1924: 92–95. 1925.—Crop rotation in potato production is considered more necessary in maintaining and increasing yields than in the case of other farm crops, because there is greater danger from fungous diseases such as Fusarium, Verticillium wilts, common scab, powdery scab, etc. Intelligent rotation of crops tends also to increase the organic content of the soil, legume crops such as the clovers or alfalfa being most valuable in maintaining soil fertility and in adding organic matter. The author has secured best results from using a certain variety of oats as a nurse crop in seeding land to grasses and clovers as a preparatory crop for potatoes. He states that for 20 years a 3-year rotation of potatoes, grain, and hay has been followed but that in recent years the high cost of labor coupled with the low price of hay and the comparatively high price of potatoes has led to the adoption of a 4-year rotation in which 2 successive crops of potatoes are grown. Surplus straw from the grain crop is spread over the meadow and plowed under for the potato crop. Commercial fertilizer made up of 7 parts of 16% acid phosphate to 1 part of muriate of potash is usually applied at the rate of a ton per acre. The 3 soil types on the author's farm have been carefully studied as to their crop adaptations, with the result that different combinations of grass, clover and alfalfa seed are sown. The lime requirements of these soils are also quite different.—*W. Stuart.*

8233. Dickey, J. B. R. **Methods used by Pennsylvania Four Hundred Bushel Club members.** Potato News Bull. 2: 148–151. 1925.—This is a composite set of recommendations for potato culture based on the practice of 33 growers in Pennsylvania who attained an average of 400 bushels per acre in 1924, and of 54 who made a similar record in 1923.—*F. Weiss.*

8234. Dimock, Julian. **Hereafter—sized seed potatoes.** Potato News Bull. 2: 242–243. 1925.—The amount of seed cut by the average worker from tubers of associated size has been determined, the results being distinctly in favor of seed tubers of uniform size.—*F. Weiss.*

8235. Dorst, J. C. **Cultuurwaarde van het witbloeivlas. [Cultural value of the white flowered flax.]** Landbouwk. Tijdschr. 37: 81–93. *1 fig.* 1925.—Formerly, blue flowered flax was much grown in the Netherlands but it is being replaced by a white flowering variety, about 60% of the flax area being devoted to this type which originated in the Province of Friesland. The writer discusses the occurrence of this flax variety in various parts of the Netherlands, the appearance of the crop while in flower, and the comparative properties of the 2 varieties. The white flowering kind is said to be more resistant to injurious influences.—*J. C. Th. Uphof.*

8236. Duryee, W. B. **Potato improvement campaign in New Jersey.** Proc. 11th Ann. Meeting Potato Assoc. America **1924**: 129–130. 1925.—During the last few years much work has been done to bring about better marketing and grading conditions in New Jersey. These efforts were conducted under the leadership of the State College, the Bureau of Markets, and the extension forces in the counties where potatoes are an important crop. Through a committee appointed in July, 1924, a united and active campaign was made to show the importance of adopting better methods of production, grading and marketing, in order that the crop might be raised and disposed of at a profit to the grower.—*W. Stuart.*

8237. Fain, John R. **Alfalfa for Georgia.** Georgia State Coll. Agric. Bull. 217. *Revised. 1–15. 10 fig.* 1925.—One of the great needs of agriculture in Georgia is a perennial forage crop. Alfalfa (*Medicago sativa*) fills this need as it is especially adapted to the Piedmont sections of the state. It is stated that alfalfa of the Nebraska and Kansas types does well in Georgia; the Grimm alfalfa is not so well adapted. Peruvian alfalfa makes good summer growth, but in the northern part of the state does not stand the winter. The bulletin contains full directions for seeding and cultivating this crop.—*T. H. McHatton.*

8238. Fiebrig-Gertz, C. **Der Baumwollenbau in Paraguay. [Cotton raising in Paraguay.]** Tropenpflanzer **28**: 76–79. 1925.—*Gossypium barbadense* was grown in the beginning of the 19th century. It was harvested the 2nd year after sowing and the plants were kept 6 years. The plants were in rows 5 feet apart. After the war of 1864–1870, cotton growing played an unimportant role but it has become prominent again in recent years. In 1918 there were exported 7,864 kg.; in 1922, 383,070 kg.; and in 1924 about 2000 tons. There are no large plantations, most of the cotton being grown in a small way with insufficient organization. The Government Cotton Institute is active in developing the industry and introducing the proper varieties.—*J. C. Th. Uphof.*

8239. Fleury, A. M. **Notes on agriculture in the Famagusta District.** Cyprus Agric. Jour. **20**: 68–69. 1925.—The author presents statistical data giving yields of wheat, barley, vetches, oats and favetta (*Vicia faba*) for the years 1920 to 1924, inclusive. A decided decrease is shown in production of each of these crops in 1924, due to lateness of the first rains which did not fall until the middle of December, 1923, and the failure of the March rains. The 1924 potato crop was a very good one. In that year fresh seed potatoes were imported from Ireland and Scotland. The summer and winter crops were estimated at 5970 tons as against 4750 tons in 1923. A record crop of oranges and lemons was produced. Salonica and Egypt are the chief consuming markets. Old plantations are being enlarged and new ones established. The pomegranate crop was good and large quantities were exported to Egypt. The carob and olive crops are also reported as having been good. A large acreage and increased yield of cotton are reported. The boll worm is stated to have made its appearance. An increase from 19,352 okes to 25,321 okes of silk cocoons is claimed for 1924.—*W. Stuart.*

8240. Fron, A. **Améliorations pastorales. [Improvement of grazing lands.]** Bull. Trimest. Soc. Forest. Franche Comté et des Provinces de l'Est **16**: 29–34. 1925.—An outline is given of a plan to facilitate and coordinate the activities of federal, state, and local agencies in improving communal grazing lands in the Jura Mountains not under the control of the Forest Service.—*J. Kittredge, Jr.*

8241. Fruwirth, C. **Die Aussaatmenge bei Sortenversuchen mit Körnerfrüchten auf Wirtschaften. [The quantity of seed for variety tests in farm practice.]** Wiener Landw. Zeitg. **75**: 147–148, 156. 1925.—The recommendation has previously been made that in farm variety tests due consideration must be given to purity and germinating capacity of the seed, and equal weights of seed should be sown. The author cites examples to show that on the basis of equal weights of seed, different varieties give widely different numbers of plants per unit area. Instead of equal weights of seed, he recommends the use of the same setting of the planter for different varieties. He also finds that ordinary farm stocks do not differ sufficiently in quality to make purity and germination tests necessary.—*F. Weiss.*

8242. Gay, M. C., and H. C. Crosby. **An agricultural survey of central Georgia.** Georgia State Coll. Agric. Bull. 304. *1–68. Pl. 10, fig. 15.* 1925.—The bulletin contains an analysis of facts for determining what crops, livestock and other farm products can be most profitably grown and marketed in central Georgia and to what extent the production of those commodities can be adjusted to meet the demands of distant markets. The bulletin gives an exhaustive description of the territory of central Georgia surrounding the City of Macon, in which an intensive study of crop production has been made.—*T. H. McHatton.*

8243. Glassen, Aug. **How to prepare the field for flax.** Cyprus Agric. Jour. 20: 1–3. *2 fig.* 1925.—According to the author, the illustrations are used for the purpose of graphically depicting the relative root and stem growth of plants in poorly- and well-prepared seed beds. Attention is called to the different behavior of plants grown from Belgian seed as compared with those produced from Cyprus-grown seed. The latter seem to have developed the acquired character of a shallow lateral root growth as compared with the deep tap root system of the Belgian seed. The author concludes his paper with the 2 recommendations: (1) "It is essential that the field be well harrowed in order to obtain a fine tilth." (2) "The seed should not be covered with more than 1½ inches of earth and no clods should be allowed to remain in the field unbroken."—*W. Stuart.*

8244. Grieder, August. **Erorterungen zum Anbau von Jute in Sao Paulo. [Growing jute in Sao Paulo.]** Tropenpflanzer 26: 49–53. 1923.—Jute growing in British India is described and the possible introduction of this crop into Sao Paulo, Brazil, discussed. Experiments have been made with *Corchorus capsularis* and *C. olitorius*, the former proving better adapted than the latter. Thirty kg. of seed were used per alqueire (= 2.42 ha.). The jute produced straight stems with little branching at the top and attained an average height of 4 m. after the fields had been properly treated and the plants thinned. Toward the end of May the crop was harvested, being cut 7 cm. above the ground. Bundles of the twigs were placed under water for 8 days after which laborers took bunches of 5–6 stems and splashed them over the surface of the water, until the bark loosened. They were then washed in fresh water, until the twigs broke, when the light fibers could be separated and easily dried.—*J. C. Th. Uphof.*

8245. Grieder, August. **Zur Frage des Anbaues von Faserpflanzen im Staate Sao Paulo. [Raising fiber plants in Sao Paulo.]** Tropenpflanzer 25: 69–72. 1922.—Sao Paulo is well suited for raising fiber plants. The writer mentions especially among the native species: kapok, *Ceiba pentandra,* lagetta fiber, *Funifera utilis,* tucumpalm, *Astrocaryum vulgare,* piassave, *Attalia funifera,* para-piassave, *Leopoldina piassava,* paranut, *Bertholletia excelsa* and *Cecropia peltata.* In the "Economical Notes on Brazil" published by the Brazilian Department of Agriculture, cotton is mentioned as a fiber plant. Among the well known fiber plants grown in various regions of Sao Paulo are the following species: sisal, Piteira (*Furcraea gigantea*), screw pine (*Pandanus utilis*), ramie (*Boehmeria nivea*), hemp (*Cannabis sativa indica*), flax, roselle (*Hibiscus sabdariffa*), tupichahu (*Hibiscus sabdardiffa* var. *camensin*), Brazilian hemp (*Hibiscus ferox*), sunn (*Crotalaria juncea*), jute (*Corchorus capsularis* and *C. olitorius*), and aramina (*Urena lobata*). The growing season starts either in September and October or from March until May. Harvest takes place from December to March or from June to August. Fifteen to twenty-four kg. of cotton are used per ha., 100 to 160 kg. of flax, 60 to 90 kg. of Brazilian hemp and 30 to 60 kg. of Indian hemp. Sao Paulo went through a severe crisis on account of the coffee production and it is therefore advisable to grow several kinds of crops. —*J. C. Th. Uphof.*

8246. Grieder, August. **Zur Kenntnis der brasilianischen Baumwollproduktion mit besonderer Berücksichtigung des Staates Sao Paulo. [Brazilian cotton production, especially that of Sao Paulo.]** Tropenpflanzer 25: 176–183. 1922.—A description is given of cotton raising in various parts of Brazil, especially in the State of Sao Paulo. A table is presented showing cotton production over 10 years in 10 states. Sao Paulo produced 11,261 tons in 1920. This state is not suitable for growing long staple cotton on account of the climate, but medium staple of the upland and Egyptian types is produced. The soil is plowed twice and harrowed 3 times. Seed are first disinfected for 1 hour in water at 55°C., followed by a sulphur bath (100 kg. dry seed to 5 kg. sulphur). Twenty-five to thirty thousand kg. of stable manure are used per ha. Velvet beans, cow peas, lupines and guardu (*Cajanus indicus*) are used as green manure. Data are given as to the use of chemical fertilizers. Several areas where coffee plants are grown and which are not free from frost, also poor meadows where few cattle are kept, could be put into cotton fields. Plants are in rows 1 m. apart, with 4–6 plants to a hill. From 15 to 24 kg. of seed are used per ha. Treatment and harvesting is the same as in other countries.—*J. C. Th. Uphof.*

8247. Hansen, Albert A. **Notes on the control of water weeds.** Jour. Amer. Soc. Agron. **17:** 119–120. 1925.—Several mechanical methods are described.—*F. M. Schertz.*

8248. Hardenburg, E. V. **Report of the committee on varietal nomenclature and testing.** Proc. 11th Ann. Meeting Potato Assoc. America **1924:** 136–142. 1925.—Through the questionnaire method, Chairman Hardenburg was able to get a response from 24 states, giving information with respect to the standard varieties of potatoes grown in the states and provinces of the U. S. A. and Canada. All reported Irish Cobbler; 14 mentioned Triumph and Early Rose; 17, Early Ohio; 2, Beauty of Hebron; 9 mentioned Burbank; 21 listed Green Mountain; 16 mentioned Rural and 9, the Russet Rural; 5 listed Pearl; 6, Peachblow; and 4, Up-to-Date. Some states indicated that an effort was being made to eliminate certain varieties from their list: Burbank from California, Louisiana, and Minnesota; Green Mountain from Montana and Pennsylvania; Peachblow from California and North Carolina; and Pearl from Nebraska, North Carolina and Pennsylvania.—This is followed by a list of varieties regarded as being worthy of more extensive cultivation in certain states. The status of the Up-to-Date group is discussed. Under false nomenclature is presented a list of varieties regarded as improperly named, usually old varieties masquerading under new names. The need of standardization of present methods is urged and the following suggestions are offered: "Arranging potato exhibits on the group classification rather than the varietal basis; revision of state and county fair premium lists; limiting varieties eligible to certification; promoting the use of certified seed; recommending specific seed sources, etc."—The origin of 2 standard varieties, Blue Victor and Brown Beauty, is thought to have been established. The Blue Victor is believed to be the old variety known as Compton's Surprise which was originated in 1870. The Brown Beauty was recognized as the old variety Prolific which was originated in 1861.—*W. Stuart.*

8249. Hawkins, R. S. **The deleterious effect of sorghum on the soil and on the succeeding crops.** Jour. Amer. Soc. Agron. **17:** 91. 1925.—Sorghum stalks retard plant growth to a greater extent than do corn stalks. The root residues are not so detrimental to plant growth as are the stalks.—*F. M. Schertz.*

8250. Hendrick, James, William G. Ogg, and John Lewis Rosedale. **Agricultural studies.** Univ. Aberdeen Univ. Studies, 1st Ser., 92. *1–195.* University of Aberdeen: Aberdeen, 1924.—This is a collected volume of papers published by the Agricultural Department of the University of Aberdeen and issued to the libraries of various institutions. Titles of the individual papers, originally appearing in various serial publications, are as follows (unless otherwise stated, Hendrick is the author): Studies of a Scottish drift soil. Part I. The composition of the soil. Part II. The absorptive power of the soil. Hendrick and Ogg.—The value of seaweeds as raw material for chemical industry.—Experiments on the treatment of growing crops with overhead electric discharges.—The measurement of soil drainage.—The composition of the rhizomes of bracken.—The food production and requirements of Scotland. Hendrick and Rosedale.—Fertilizers before and after the war.—The value of mineralogical examination in determining soil types. Hendricks and Newlands.—An experiment on finger-and-toe by liming.—Drainage investigations at Aberdeen.—*Frederick V. Rand.*

8251. H[ilgendorf], F. W. **Variety trial of mangels.** Canterbury [New Zealand] Agric. Coll. Mag. 5: 25–27. 1924.—A comparison is given of the weight and dry-matter returns of the varieties. Yellow Globe, Long Red, and Golden Tankard. Long Reds give the heaviest crop with the greatest amount of dry matter per acre.—*H. H. Allan.*

8252. Höyer, James. **Det Kgl. danske Landhusholdningsselskabs Kontrol med Korn og Foderstoffer i Köbenhavns Frihavn i Aaret 1924. [The Royal Danish Agricultural Society's control over importation of grain and feed into the free harbor of Copenhagen during 1924.]**

Tidsskr. Landøkonomi **4**: 198–206. 1925.—A discussion by the Society's inspector, of results attained by the Royal Danish Agricultural Society in the control of the importation of seed and feeds into Denmark during 1924. Special attention was paid to analyzing imported seed with a view to avoiding the introduction of noxious weed seed. Eleven tables of statistics are presented.—*Albert A. Hansen.*

8253. Huber, R. **Einiges über die Kultur des San Andrés-Tabaks in Mexiko. [Growing San Andre tobacco in Mexico.]** Tropenpflanzer **26**: 33–38. 1923.—San Andre tobacco is very important on the world market. It is broad leaved, of medium specific gravity, dark gray, dark brown and blackish in color. It is mainly exported to Germany, Belgium, Holland and England, and is grown principally in San Andres Tuxtla, in the State of Vera Cruz. The seed are planted in July, but much is lost through primitive methods. Some improvement has been made by German settlers who plant the seed on beds under cover of oil paper, oiled cloth, grass, etc., and in such a manner that ants do not cause damage. Sometimes the seed are mixed with water and thus equally distributed by watering. The young plants are transplanted 7 × 7 cm. apart. They are retransplanted into the fields in September in rows 1 vara (84 cm.) apart and the plants ½ vara apart in the rows. After 3½–4 weeks the plants are topped, leaving about 12 leaves on each. The plants left for seed production are not topped. Selection depends upon shape, color and number of leaves. The leaves are harvested 75 days after planting; the operations of harvesting and drying are described. After 2 fermentations (matulis and troja fermentation) the leaves are sorted into 5 grades, after which they are again fermented (gabilla fermentation) and packed.—*J. C. Th. Uphof.*

8254. Jones, Jenkin W. **Rice experiments at the Biggs Rice Field Station in California.** U. S. Dept. Agric. Dept. Bull. 1155. *1–60. Fig. 1–15.* 1923.—Cultural, irrigation, fertilizer, and varietal experiments with rice and weed control are described, and a brief review of rice growing in California and notes on the environmental conditions at the Biggs Rice Field Station are given.—In depth-of-seeding experiments (1913 to 1921), the highest average yield was obtained from a 2 inch depth. Shallow seeding was better than deep seeding. When rice was drilled or sown broadcast the highest average yields were obtained from the heaviest rates of seeding. In 1921, three varieties of rice indicated that 150 pounds is probably the best rate of seeding on old rice land. In date-of-seeding experiments (1913 to 1921), a marked decrease in yield was obtained with each successive date. Rice grown continuously on the same land from 1913 to 1919, inclusive, produced an average yield of 3,528 pounds per acre.—In-time-of-submergence experiments (1914 to 1921), the highest average yield was obtained by submerging the land 30 days after the rice emerged. In-depth-of-submergence tests, submerging the land 6 inches during the period of submergence gave the highest average yield. Fluctuation in the depth of submergence, for the same period, gave higher average acre yields than slowly changing or stagnant water. Land kept moist but not submerged during the usual submergence period produced dwarfed plants and low yields of poor quality. The best irrigation practice, on land free of water grass, consists of irrigating the rice as often as necessary until 30 days after emergence, and then submerging the land 6 inches continuously until the crop is ready to drain for harvest.—Fertilizer experiments (1914 to 1919), showed that manure increased the average yield 1,046 pounds, sulphate of ammonia 707 pounds, and dried blood 628 pounds per acre, respectively. All nitrogenous fertilizers except sodium nitrate produced profitable increased yields, whereas non-nitrogenous fertilizers were usually unprofitable on Stockton adobe soil. Combinations of the 2 groups of fertilizers were usually uneconomical.—Varietal experiments show that the long-grain and medium-grain rices are not well adapted, while the short-grain rices do well under California conditions and constitute about 98% of the rice grown in the State. In the 9-year period (1913 to 1921), Watarbune, a late maturing, short-grain variety yielded 4,364 pounds; Butte, a midseason short-grain variety, 3,456 pounds; and Honduras, a long-grain late maturing variety, 2,600 pounds per acre, respectively. In general, the late maturing, short-grain varieties produce higher average yields than the midseason, short-grain varieties, and the midseason varieties produce higher average yields than the early maturing, short-grain varieties. Many varieties and selections that have been grown in the nursery are listed. Early rice varieties mature in 135–154 days from the 1st irrigation; midseason varieties in about 161 days; and late varieties in 176 to 180 days. Caloro, Early Wataribune, Colusa, and Onsen, the leading commercial rice varieties in California are briefly described.—The worst weed in California rice fields is barnyard grass (*Echinochloa crusgalli*) and its varieties. Methods of control for this grass consist of hand-pulling, cultivation during fallow years, and continuous submergence from date of broadcast seeding until the rice crop is ready to drain for harvest. Other weeds which are troublesome include scale grass, spike rush, cat-tails, umbrella plants, and canary grasses. —Beans, corn, grain sorghums, cotton and hemp have not been grown successfully, largely due to a high water table when grown near submerged rice land. Wheat and barley appear to be the best crops to use in rotation with rice. After growing rice, the land should be fallowed 1 summer before seeding to wheat or barley.—*Author.*

8255. Jones, W. E. D. **Experiments on the growing of early potatoes.** Welsh Jour. Agric. **1**: 115–119. 1925.—The results of 2 field experiments (1922) in the growing of early potatoes in Pembrokeshire were so successful that a number of local farmers repeated the test the following season with very satisfactory outcome. "The conditions are favourable for the cultivation of this crop along the entire coast regions of the county, and our coast is a very long one."—*Frederick V. Rand.*

8256. Keatinge, G. F. **Cotton growing in South Africa.** (Empire Cotton Growing Corporation.) *67 p. Map.* [Guilford and Escher, Eng., Printed by Billing & Sons, Ltd.]: London, 1923.—This is the author's report to the corporation on a tour undertaken in South Africa November, 1922, to March, 1923. The following chapter headings express its scope: Account of past cotton growing in South Africa, climatic factors, soils and irrigation facilities, agricultural practice, labor, insect attack and plant diseases, scientific investigation, field trials and seed supply, the cotton tracts considered separately, handling and marketing, financing, prospects for cotton growing in South Africa, and recommendations.—*Frederick V. Rand.*

8257. Kerle, W. D., and B. M. Arthur. **Farmers' experiment plots. Wheat and oat experiments, 1924.** Agric. Gaz. New South Wales **36**: 311–325. *6 fig.* 1925.—Trials were made upon 22 private farms in 2 districts. The yields were generally good, the 2 outstanding wheat varieties being Waratah and Wandilla. Diseases among the wheat varieties were rather prevalent. It is noted that loose smut is becoming worse each year and should not be regarded with indifference. The copper carbonate treatment for bunt proved successful as usual. Results of certain fertilizer trials are also given.—*L. R. Waldron.*

8258. Kidder, A. F., and C. E. Coates. **Sugar beets in Louisiana.** Louisiana Agric. Exp. Sta. Bull. 192. *1–23.* 1924.—The results of several years' experimental work on the growth of sugar beets in Louisiana are recorded. It is indicated that sugar beets might be grown on a commercial scale in the state and used to lengthen the grinding season of the sugar cane factories.—*E. C. Tims.*

8259. Kuenning, A. C. **Fact-finding for northwestern North Dakota farming—1908–1924.** North Dakota Agric. Exp. Sta. Bull. 190. *1–36. 7 fig.* 1925.—For 15 years durum wheat has not yielded appreciably more than common hard red spring wheat at Williston. Power Fife and Marquis have shown almost identical yields. Mid-season varieties of oats have proved themselves decidedly superior to either early or late varieties. The early flint corn varieties have demonstrated their great superiority over other, later, varieties. The mid-early semi-dent Northwestern stands second in yield. Corn yields of sufficiently early varieties are more apt to be reduced by dry weather in August than by early fall frosts. In 1923 Sudan grass outyielded millet varieties and Dakota Amber sorghum. In the class of early potato varieties, Eureka produced the maximum yield of 134 bushels as an average of 13 years, while Early Ohio yielded 106 bushels for the same period. Less complete results indicate late varieties to yield as well as early varieties. Sugar beets grown under non-irrigated conditions were not generally successful for the years 1921–1924, due to frosts and inability to secure stands. One variety each of oats, wheat and barley yielded less per acre with 1 early application of water than when grown under dry land conditions; 2 irrigations doubled the yield over those secured from 1 irrigation. Flax and wheat grown in combination gave a somewhat better gross return per acre than was secured from either crop grown alone. Sunflowers grown under irrigation gave very much larger yields of fodder per acre than when grown under dry land conditions.—*L. R. Waldron.*

8260. Limbourn, E. J. **Lucerne in the eastern wheat belt without irrigation.** Jour. Dept. Agric. Western Australia (2nd Ser.) **1**: 326–327. *2 fig.* 1924.—This is a brief account of a successful experiment in the growing of lucerne in rows.—*P. J. Olson.*

8261. Lindeberg, Erik. **Södra Sveriges Kolonisation. [Colonization in southern Sweden.]** Skogen **12**: 97–104. 1925.—Activity in colonizing agricultural lands on northern state forests suggests that similar attempts should be made to reclaim suitable land in southern Sweden.—*Henry I. Baldwin.*

8262. Lowe, G. N. **Cultivation of the potato. Seed, its selection and treatment (continued).** Jour. Dept. Agric. Western Australia (2nd Ser.) **1**: 338–341. *1 fig.* 1924.—This is a brief discussion of methods of cutting and planting.—*P. J. Olson.*

8263. Lowe, G. N. **Cultivation of the potato.** Jour. Dept. Agric. Western Australia 2nd Ser. **1**: 529–530. 1924.—A brief popular article. Potato seed is described, and a few suggestions are offered relative to the plant food requirements of the crop.—*P. J. Olson.*

8264. MacDougall, A. H. **Trangie experiment farm. Harvest report. Season 1924-25.** Agric. Gaz. New South Wales **36**: 257–258. 1925.—A report is given upon 7 varieties of wheat and 2 of oats. The largest yield of wheat was secured from Hard Federation, followed by Canberra.—*L. R. Waldron.*

8265. McKee, Roland, and Harry A. Schoth. **Common vetch and its varieties.** U. S. Dept. Agric. Dept. Bull. 1289. *1–20. Fig. 1–8.* 1925.—The introduction of *Vicia sativa* into the U. S. A., classification of the varieties and data from experimental tests regarding their agronomic value, and the data of cultural tests with commercial varieties given in tabulated form, are discussed. *Vicia augustifolia* is recognized as a distinct species.—*Roland McKee.*

8266. McKee, Roland, and H. A. Schoth. **Hungarian vetch.** U. S. Dept. Agric. Dept. Bull. 1174. *1–11. Fig. 1–4.* 1923.—*Vicia pannonica* was first introduced into the U. S. A. in 1905. The real value of the crop was not determined until some years later. The present bulletin discusses the results of cultural experiments which were carried on largely at Corvallis, Oregon.—*Roland McKee.*

8267. Mameli de Calvino, Eva, and Francisco Mastio. **Accion del frio sobre la germinacion de las yemas de la cana de Azucar. [Action of cold on the sprouting of the buds of sugar cane.]** Chaparra Agricola [Cuba] $2^{1,2}$: (1–9). 1925.—Cooling the cuttings of cane in cold water at 4°C. was not found very beneficial, but good results, both in increased number of buds sprouted, and in decreased time for sprouting, were obtained by keeping the cane buds in a refrigerator 2–8 hours at 0–7°C. Cooling 3, 6 and 8 hours at 0°C. cut down the time of sprouting about 20%; 8 hours at 3–5.8°C. increased the yield of sprouted buds by 71% over the check, and 3 hours at 6.8°C. increased the yield 62%.—*J. B. Rhine.*

8268. Marchal, Em. **L'enseignement supérieur agronomique dans le cycle des hautes études. [Superior agronomic instruction in the program of higher education.]** Bull. Cl. Sci. Acad. Roy. Belgique **7**: 785–805. 1921.—The author, after having shown that all advancement achieved by agricultural practice is the fruit of scientific research, suggests extensive lines of organization of agricultural instruction suitable to produce the modern scientific agriculturist. He sums up this program as follows: Highly scientific preliminary training; complete general technical training, moderate specialization.—The author insists upon the necessity of having superior agricultural instruction made an integral part of university instruction in order that the students may benefit by the same methods and the same spirit.—*Author (translated).*

8269. Marchal, Em. **Les mauvaises herbes et leur destruction. [Troublesome weeds and their destruction.]** Ministere Agric. Belgique Leçons Agric. 3. *1–18.* 1920.—The leaflet contains brief elementary lessons on weeds, particularly those of cereal crops, and treats of injuriousness, manner of growth and reproduction, and methods of control.—*Author. (translated).*

8270. Martin, Wm. H., and J. W. Shive. **Influence of soil moisture on the relation between fertilizer treatment and the growth of potatoes.** New Jersey Agric. Exp. Sta. Ann. Rept. **44**: 237–240. 1923. [1924].—This study was conducted with the Irish Cobbler variety grown in pots containing 8 kgm. of soil. Eight series of 5 cultures each were conducted, 4 receiving an application of fertilizer mixture carrying 4% nitrogen, 8% phosphoric acid and

5% potash applied at the rate of 1000 pounds per acre, and the remaining 4 series an application of the same mixture at the rate of 2000 pounds per acre. The various cultures were prepared with moisture contents of 25, 35, 45, 55 and 65% of the water holding capacity of the soil which was 40% on a dry weight basis. With but a single exception, there was an increase in dry weight of vines with each increase in soil moisture in both the heavy and light fertilizer applications. With the exception of the culture having the highest moisture content, the dry weight values were greater for the 1000 pounds than for the heavier fertilizer application. The water requirements of the vines increased with each increase in soil moisture and, with but one exception, the high fertilizer series required less water to produce a gram of dry matter than did the low fertilizer series.—The maximum yield of tubers was produced in cultures of medium rather than of highest moisture content, the optimum for the heavy fertilizer application being 45% and for the low fertilizer series, 55%. With the exception of the culture having 25% moisture content, the low fertilizer series outyielded the high. The water requirement of the series receiving the 2000-pound application of fertilizer was greater than for the cultures in the series receiving 1000 pounds.—*Wm. H. Martin.*

8271. Maschhaupt, J. G. **Het in cultuur brengen van pas bedijkte kweldergronden in 't algemeen en van den Carel Coenraad polder in 't bijzonder. [Bringing under cultivation lands diked from the sea and especially that of the Carel Coenraad polder.]** Landbouwk. Tijdschr. **37:** 122–134. 1925.—New land reclaimed from the sea has to be carefully managed. As early as 1570, Andries Vierlingh pointed out the necessity of shallow plowing. These soils, which are sometimes covered by sea water, have the property of dividing finely in the water, forming a muddy liquid, in which the clay particles do not easily settle. By shallow plowing that part of the soil that resembles to a certain extent the soil of normal cultivated land is brought to the surface. The soil must not be worked too much and must be well drained in order that the air may penetrate it. The salty substances are best removed by percolation of rainwater. The Dutch poet, Jabob Cats, stated that rape (*Brassica rapus oleifera*) and winter barley should be the 1st year's crop on such soils. Andries Vierlingh stated that the 1st crop should be summer barley which is sown in April. Flax grows well but produces an inferior yield. The 2nd year, oats are grown on the heavy soils and rye on lighter ones. After the 3rd year a broader selection of crops is made. Beets are not grown the first 3 years, for, although the crop is good, it requires an intensive cultivation which is not recommended for such new soils. Probably caraway, which is much grown in Zeeland, may be a good crop.—*J. C. Th. Uphof.*

8272. Mathews, O. R. **Predicting yields of spring wheat in the great plains.** Jour. Amer. Soc. Agron. **17:** 89–90. 1925.—The prediction is based upon the quantity of available moisture in the soil and the average rainfall from seeding to harvest time.—*F. M. Schertz.*

8273. Matthews, F. **Condobolin experiment farm. Wheat variety trial for grain, 1924.** Agric. Gaz. New South Wales **36:** 264–265. 1925.—Results are given from growing 17 varieties of wheat under experimental conditions. Maximum yields were secured from certain new varieties, some of them unnamed. A cross of Indian F × Federation gave the maximum yield of 32 bushels per acre.—*L. R. Waldron.*

8274. Mayer Gmelin, H. **Beta maritima.** Landbouwk. Tijdschr. **37:** 45–52. *1 fig.* 1925.—The occurrence of wild *Beta maritima* in some parts of the Netherlands is discussed, especially in relation to the cultivated forms of beets.—*J. C. Th. Uphof.*

8275. Moebius. **Gedanken über die kommende Frühjahrsbestellung, zugleich ein Beitrag zur Verbilligung unserer Viehhaltung. [Suggestions for spring cultivation and for cheapening the cost of keeping livestock.]** Forstwiss. Centralbl. **47:** 235–238. 1925.—The extensive planting of comfrey (*Symphytum asperrimum*) is recommended. It is said to thrive on all but very dry, sandy soils, to yield 4 cuttings the first year and 5–7 cuttings in subsequent years, and to furnish excellent fodder for all classes of livestock, particularly swine. The Matador variety is the best.—*W. N. Sparhawk.*

8276. Moomaw, Leroy. **Dickinson Substation report for 1922 and 1923.** North Dakota Agric. Exp. Sta. Bull. 189. *1–46.* *8 fig.* 1925.—Average acre yields of wheat for 16 years after spring and fall plowing were 16.2 and 16.5 bushels, respectively. Oats and barley on spring plowing slightly outyielded that on fall plowing for the same period. Wheat following fallow for 16 years averaged 21.6 bushels per acre, and following small grains the average yield was 15.9 bushels. Corn grown on fallow yielded less grain than when grown on fall or spring plowed land, except in dry warm seasons, when fallow yields were higher. For 16 years corn fodder averaged 3707 pounds on spring plowing, 3277 pounds on fall plowing, and 3248 pounds on fallow. As an average of 16 years, wheat on disked corn ground yielded 19.7 bushels per acre, in comparison with 21.6 bushels after fallow. Wheat and oats yielded slightly more on disked corn ground than on plowed corn ground. Wheat after fallow for 16 years averaged 21.5 bushels per acre, compared with 17.4 bushels after green manure. Oats after fallow also yielded more than oats after green manure. Wheat in rotation yielded 18.4 bushels for 16 years, compared with a yield of 12.6 bushels for wheat grown continuously. The presence of weeds was evidently the main cause of decrease in yield. In a tillage and date-of-seeding (5 semi-monthly dates) experiment with flax, the seeding of May 15 on land that had been previously spring-toothed twice and harrowed before seeding gave the maximum yield. As an average for 11 years the maximum yield of wheat (23 bushels) was secured from Monad, followed by Kubanka, Arnautka, and Marquis in order. Comparing spring and winter wheat yields for 11 years, Monad averaged 23 bushels, Marquis 17.3 bushels, and the 3 best winter wheats averaged from 12 to 12.7 bushels, Beloglina being the highest. For an average of 5 years Dakold winter rye outyielded other varieties and also spring rye. In variety trials with oats the highest yield secured for an 11-year average was from Victory at 51.9 bushels, followed by Golden Rain. Kherson and 60-day yielded 44.3 bushels per acre. Two-rowed hulled varieties of barley commonly outyielded the 6-rowed hulled varieties. As an average of 5 years Dakota White (flint) corn yielded 31.1 bushels per acre, Gehu 29.6, Northwestern Dent 28.7, and Minnesota 13, 24.1. As an average of 4 years the flax variety Stark gave the maximum yield of 11.6 bushels, and for the 9-year average the variety Damont gave the maximum yield. For 1923, 1 flax-wheat mixture gave a gross income of $26.03 per acre, while flax alone gave an income of $24.59 and wheat alone produced an income of $14.88. As an average for 4 years the best Proso millet variety, Red Russian, yielded 16 bushels per acre, which was considerably less than the best varieties of oats or barley. Grain sorghums have generally been failures. Results for 1 year showed *Melilotus alba* (common) to outyield the Arctic variety in hay, both in rows and close drills. Yellow sweet clover has made more reliable stands when sown with a nurse crop. *Bromus inermis* outyielded *Agropyron tenerum* in rows, but was outyielded by the latter in close drills. Both species outyielded *Agropyron cristatum* both in rows and close drills as an average for 3 years. Various millet varieties decidedly outyielded Sudan grass for the 2 years 1922 and 1923. Results from field peas have varied from failures in dry years to 2 tons of hay or 20 bushels of seed in favorable years. Soybeans have not been a profitable crop. Mangels and swedes have averaged from 6.5 to over 8 tons per acre for 3 and 4 years. Carrots averaged over 3 tons for 3 years. Rape, for a 4-year average, yielded over 12 tons per acre. As an average for 7 years, 5 potato varieties yielded from 109 to 139 bushels per acre, the greatest yield being secured from Irish Cobbler.—*L. R. Waldron.*

8277. Mukden, Bericht des Deutschen Konsuls. **Die Sojabohne in der Mandschurei. [Sojabeans in Manchuria.]** Tropenpflanzer **26**: 88–90. 1923.—All available land in Mukden and Kirin is being used for sojabean growing. In the northern part of Heilungkiang some land is still available. In Manchuria 2,540,000 tons of beans are produced annually. Soja oil is used as food and as fuel and is an important product on the Chinese markets. Oil pressing is generally very primitive. Most of the oil is pressed by hand-mills, there being very few modern establishments. Bean cake is mainly exported to Japan where it is used as fodder and as fertilizer.—*J. C. Th. Uphof.*

8278. Müller, Willi. **Die Hamfknickmachine Shely. [The hemp machine of Shely.]** Tropenpflanzer **25**: 56–58. 1922.—The hemp machine of Shely in Chicago is said to cause very little damage to the fiber.—*J. C. Th. Uphof.*

8279. Musgrave, George W. **Annual Report of the Department of Agronomy.** New Jersey Agric. Exp. Sta. Ann. Rept. **44**: 153–165. *1 pl.* 1923 [1924].—In comparative tests with corn the Burr Leaming, double-crossed corn proved to be one of the best varieties included in any of the tests in the northern part of the state. Variety tests with oats and barley indicated the value of short season varieties such as Kherson and Iowar; the longer season varieties lodged badly and full development of the grain was inhibited by hot weather. The Japanese variety of Buckwheat proved to be superior to the Silver Hull. In a study of the influence of the size of potato seed-piece on yield it was found that there is an increase in the number of stems per plant as the size of the seed piece is increased, in one test the average number of stems per plant for ½ ounce seed pieces being 1.28 and from 2 ounce pieces 3.54. In another test the number of stems per hill was 1.475 and 3.7, respectively. In a variety test with alfalfa, the Grimm and Northwestern common varieties showed less winter killing than the common varieties from Kansas.—*Wm. H. Martin.*

8280. Musgrave, George W. **Cover cropping practice in New Jersey.** Potato News Bull. **2**: 153–155. 1925.—A survey is made of the kinds of cover crops, and the value of the crop, expressed in terms of increased yield of potatoes following the green crop, in sections of New Jersey where intensive potato culture and the lack of animal manures require this practice to maintain soil fertility.—*F. Weiss.*

8281. Nelson, N. T. **The effects of frequent cutting on the production, root-reserves and behavior of alfalfa.** Jour. Amer. Soc. Agron. **17**: 100–113. 1925.—Frequent cutting of alfalfa in premature stages results in depleted root-reserves. This causes slow recovery and rate of growth after cutting, low yields of hay, increased weed infestations and retarded root growth. An increase in the number of crown buds, shoots and main stems occurs as an immediate effect with frequent and early cutting, but the average height and total yields of these top growths are much less than with less frequent cuttings at more mature stage. Chemical analyses of alfalfa roots and physiological observations show that stored organic foods in the roots of certain plants such as alfalfa have an important influence on their productivity. Both the nitrogen and carbohydrate reserves of the root are decreased by cutting the crop too early.—*F. M. Schertz.*

8282. North Carolina Agric. Exp. Sta. **Recent results of work of the North Carolina Agricultural Experiment Station and the present program of work.** North Carolina Agric. Exp. Sta. Bull. 247. *1–72.* 1925.—This bulletin is divided into 2 parts, the first of which contains a summary of the more recent achievements of the Experiment Station and the other, the program of work. The report is arranged according to the subjects being investigated. The report on plant breeding contains statements of the findings in the breeding of cotton, corn, oats, wheat, rye and soybeans.—That part dealing with fertilizer problems deals with the best fertilizer mixtures for the different crops on the different soil types. The portion dealing with plant diseases mentions the findings on diseases of tobacco and soybeans, cotton anthracnose, etc., all of which have been reported elsewhere in bulletins and technical papers.—Summarized statements are also included of investigations in entomology, animal husbandry, horticulture, poultry, and drainage.—The program of work lists the subjects of investigation, their object, the status of the projects and the location of the different lines of investigation. —*F. A. Wolf.*

8283. Oakley, R. A., and H. L. Westover. **Forage crops in relation to the agriculture of the semi-arid portion of the northern great plains.** U. S. Dept. Agric. Dept. Bull. 1244. *1–52. Fig. 1–18.* 1924.—The regions specifically considered in this bulletin include northwestern Nebraska, eastern Wyoming, western North and South Dakota, and the greater part of Montana. The average annual precipitation varies from 20 to 12 inches. The region is noted for extremes in temperature. For the most part, the soils are capable of producing good crops when moisture is not a limiting factor. Cereals are the chief crops. Forage, especially native grasses, contribute largely to the agricultural resources by making stock raising possible; therefore, considerable space in this bulletin has been devoted to the experimental results extending over a period of years at 11 experiment stations located in various parts of the area. The most important and most dependable forage crops are alfalfa, corn, grain hay, and sweet clover. Sorghum is grown extensively in the southern part of the area and millets are utilized as an emergency crop. Field peas, soybeans, and root crops are grown only to a limited extent. Attempts to improve the ranges have not met with much success. The silo as a means of storing feed during extended periods of drouth is an important consideration. In a well balanced farming system the ideal ratio of forage to grain would appear to consist of sufficient forage and pasture for livestock to guarantee a living to the family and added to this as much grain as the family can handle with additional labor only at harvest time. It is very evident that the farm unit must be much larger than the present general size.—The bulletin contains 18 illustrations and 27 tables, most of which are devoted to the yields obtained with various forage crops.—*H. L. Westover.*

8284. O'Byrne, F. M. **Cover crops on high pine land.** Florida Grower 31^{22}: 18. *2 fig.* 1925.—Volunteer cover crops in Florida are generally of poor quality. Natal grass is by far the most common but it makes a rather sparse growth and does not shade the ground. On the other hand 5 to 10 tons of leguminous cover crops can be grown on 1 acre. The 3 legumes most commonly used in the citrus groves are velvet beans, cowpeas and beggarweed. Velvet beans have not gained wide popularity. They do best when planted in rows and cultivated at first, and cultivation is expensive. Furthermore, the vines are a nuisance because they quickly run into the orange tress. Their value also is largely destroyed by the velvet bean caterpillar. The cowpea has long been a favorite but unfortunately it does not reseed itself. In a wet spring, best results can be had by planting in March but more often the cowpeas are planted in May just before the rains set in. One half to one bushel of seed is used per acre. Beggarweed is a splendid soil builder and is still the standard cover crop in citrus groves. It is sometimes quite difficult to start on sandy hills but once started will reseed itself. Fresh seed should always be used. Some growers get better results with beggarweed by growing cowpeas in the grove a year or two first. *Crotalaria* is an excellent cover crop and also a trap crop for pumpkin bugs. It reseeds itself, requires no inoculation or cultivation and grows on new or old land. If cut as soon as it starts to blossom, it stools out and produces a seed crop on stems fine enough to cut.—*J. C. Th. Uphof.*

8285. Pack, Dean A. **Storage of commercial beets.** Through the Leaves [Denver] **1925**: (1–10). 1925.—Results of the experiments discussed show that the quantity of sugar lost by beets in storage is directly proportional to their loss of weight, or the dryness of storage. It is therefore advised that beets be stored in such a way as best to conserve their water content. In considering sugar losses during storage the following should be considered: All abnormal roots and foreign material should be excluded from storage piles which should be made as compact as possible. Piles should be protected by compact walls to lessen air circulation and prevent freezing, and the surface covered with a moisture-holding cover which should be sprinkled in warm, dry weather. In brief, any practical measures which keep the beets moist, at a lower temperature, and under reduced ventilation will greatly reduce sugar loss in storage.—*Frederick V. Rand.*

8286. Paravicini, Eugen. **Die Kartoffelkultur in Niederländisch-Ostindien. [Potato growing in Dutch East India.]** Tropenpflanzer **26**: 75–80, 123–126. 1923.—The Irish potato grows in Java only at the higher altitudes in a cool climate. Lembang (1,400 m. above sea level), north of Bandong, where potatoes are grown on a large scale, has an average temperature of 19.4°C. When grown in the tropical region near Buitenzorg, the stems become long with small leaves and the tubers are small. The crop is grown in a loose deep soil of volcanic origin. There is no regular crop rotation. Sometimes the potatoes are followed by maize grown for green fodder, followed again by potatoes. For the west monsoon planting, tubers are planted from the latter part of September to November and harvested from January to the middle of February. For the east monsoon planting, tubers are planted from March to April and harvested from June to July. Seed potatoes require a resting period of about 100 days in order to start growing properly. Treatment in the field, condition of seed potatoes, manuring, harvesting and diseases are described. The following varieties are recommended: Eigenheimer (imported from Holland), Ursone I, II, III, Schulmeister and Rosskopf.—*J. C. Th. Uphof.*

8287. Parnell, F. R. **Yield of paddy affected by thickness of seed-bed.** Year Book Madras Agric. Dept. **1923**: 25–27. 1924.—An increase in crop was obtained by decreasing the seed rate.—*P. S. Jivanna Rao.*

8288. Paspaleff, G. **Stimulations-versuche an Polygonum (Buchweizen). [Stimulation experiments with buckwheat.]** Zellstimulationsforsch. **1**: 149–169. *Fig. 1–17.* 1924.—As a result of the stimulation experiments of M. Popoff the author undertook many confirming experiments with buckwheat (*Fagopyrum esculentum*). As stimulating solutions, combinations of $MgCl_2$, $MgSO_4$, and KI were employed. The investigation shows that after optimal stimulation, plants are produced which are much stronger and better developed than the controls and show an increase of over 50% in yield. In addition to the earlier investigation of Popoff the author also established the important fact that the effect of the stimulation also remains behind in the 2nd generation to a fairly noticeable degree.—*M. Popoff*, (*translated by C. M. Conrad*).

8289. Patterson. **Wheat and fallowing.** Jour. Dept. Agric. Western Australia 2nd Ser. **1**: 261. 1924.—This is an abstract of a paper by Patterson in which he urged more careful analysis of the increase in yield following fallow. It is pointed out that in addition to conserving moisture, fallow improves texture, increases the amount of nitrate nitrogen, flocculates clay and kills weeds.—*P. J. Olson.*

8290. Pearse, Langdon, C. H. Hurd, E. B. Phelps, and W. L. Stevenson. **The value of sludge.** Amer. Jour. Public Health **15**: 200. 1925.—This is a brief committee report to the Sanitary Engineering Section of the American Public Health Association at Detroit, Michigan, Oct. 23, 1924. It treats chiefly of results on greenhouse and garden crops and lawns in the Midwest, U. S. A.—*C. A. Ludwig.*

8291. Petree and Dorr Engineers, Inc. **The Petree process in the Philippine Islands.** Internat. Sugar Jour. **27**: 190–194. 1925.—The Petree process, which was first used in Queensland, has been adopted within a comparatively short time by more than 60 sugar factories in the Philippines, and the use of the Dorr clarifiers in Cuba alone has increased within the space of 5 crops to a point where ¼ of the 4,000,000 ton sugar crop is made in factories having them. The authors give particulars of a typical Petree-process house, describe the process, discuss its economic advantages, answer objections raised against it, and give tabular comparisons of results obtained in factories with and without this process.—*Nellie E. Fealy.*

8292. Pitt, J. M., W. D. Kerle, and E. B. Furby. **Farmers' experiment plots. Winter fodder trials, 1924.** Agric. Gaz. New South Wales **36**: 229–237. 1925.—These trials were carried out on 32 private farms, mainly along the lower north coast. Sunrise oats with and without legumes produced the best and most popular crops, in comparison with varieties of wheat and barley, generally sown alone. Vetches sown with oats gave better results than field peas. In one instance 112 pounds of superphosphate per acre gave an increased yield of over 2 tons of crop, green weight.—*L. R. Waldron.*

8293. Popoff, Methodi. **Feldversuche mit Saatgut stimulierung von Reis, Baumwolle und Tabak. [Field experiments with seed stimulation of rice, cotton, and tobacco.]** Tropenpflanzer **27**^{2}: 32–38. 1924.—By stimulating seed of rice, cotton and tobacco in different stimulation mixtures of magnesium, manganese, mercury, potassium, and phosphorus compounds the author has succeeded in getting, in large field experiments (rice, on 8 hectares; cotton, on 2 decares; and tobacco, on 2 decares) a remarkably stronger development of stimulated plants in comparison to the controls, and in obtaining an increase of 30–50% in the harvest. These experiments promise to have great significance for practical agriculture. The investigation is being continued.—*M. Popoff* (*translated by C. M. Conrad*).

8294. Preuss, Paul. **Über Kokosfasern, ihre Gewinnung und Verwendung. [Cocoa-nut fibers, their harvest and use.]** Tropenpflanzer **27**: 159–169. *2 fig.* 1924.—There is no complete machinery for separation of the cocoa-nut fibers and labor is expensive and scarce. For this reason the fiber derived from the fruit is often used as fuel. Single fibers have a length of less than 1 mm. Groups, however, are 25–35 cm. long. There are 2 types of fibers, those used for ropes and nets, and those used for brushes, brooms, artificial horse hair, etc. Large, long nuts produce long fibres; small and round nuts give short fibers. The degree of ripeness of the fruit is important since unripe fruits produce flexible, weak fibers. Fiber manufacturing in different countries is described in detail.—*J. C. Th. Uphof.*

8295. Rabaté, E. **Emploi de l'acide sulfurique pour la destruction des herbes et pour la lutte contre divers parasites. [Spraying with sulphuric acid against weeds and fungus pests.]** Rév. Path. Vég. et Entomol. Agric. **11**: 288–298. *Pl. 2.* 1924.—Leaching of lime becomes greater in soils which have been sprayed with sulphuric acid, and liming should be increased accordingly. Spraying with sufficiently concentrated solutions kills all weeds except a few monocotyledonous plants such as grasses and cereals. The latter while they appear to be injured, recover within a fortnight, and even grow more vigorously. "Piétin" (take-all disease) usually proves less dangerous. Increases in crop yields are reported to average

100 kg. per acre. Destruction of mosses and *Cuscuta* with sulphuric acid is suggested, and spraying of fruit trees during winter is advocated.—*J. Dufrenoy.*

8296. Roberts, E. J. **The production of green crops on arable land for dairy cows.** Welsh Jour. Agric. **1**: 99-103. 1925.—These crops, by producing a greater weight of food from the soil than a grass crop, make a useful supplement to the summer grass supply, particularly on small farms. They provide useful insurance against the effects of a dry summer, or enable more stock to be kept during summer, or more land to be reserved for hay, thus keeping more stock over winter. In a season of plentiful grass supply, these crops may be used for silage, or may be allowed to mature for thrashing. A large number of trials in North Wales have shown mixtures containing oats and vetches sown in autumn, in early and in late spring, to be most effective.—*Author.*

8297. Saldana, J. A. **A comparison of Java Unknown with the Uba cane.** Louisiana Planter and Sugar Manuf. **72**: 518-519. 1924.—The cane mentioned by the author as Java Unknown presumably came originally from Java, but was received without name. It belongs to the same type as Uba and shows the following differences from the Uba cane: It has double buds, germinates better, is more vigorous, has darker green leaves, defoliates and strips easier. While Uba arrows at 10-12 months, the Java Unknown does not arrow. Although the Java Unknown is slightly lower in sucrose content, purity and extraction, it yields a greater tonnage and more sugar per acre than Uba. It is advisable to replace Uba with the Java Unknown but only until better varieties can be obtained.—*Peter J. Klaphaak.*

8298. Schmidt, Geo. A. **Die Landwirtschaft in Mexiko. [Agriculture in Mexico.]** Tropenpflanzer **27**: 110-124. 1924.—Conditions of soil, climate, rainfall, prices of land and agricultural economy are described. Agriculture in Mexico is very little developed, and although there are few good plantations, methods in general are primitive. The land of the large owners is rented to natives on payment of ½ of the harvest. Outside of the plantations, crop growing is as follows: (1) Pasture, (2) mixed farming, (3) crop raising without irrigation, (4) crop raising with irrigation and (5) garden crops. Agriculture becomes more intensive when irrigation is practised and mixed agriculture is found chiefly near small cities and villages. Maize and beans (frijoles) are the principal products from non-irrigated land; whereas onions, tomatoes, peppers (chillies) and strawberries come from the irrigated areas. On the high elevations of Pueblo, Anahuac and further north to San Luis Potosi and Zacatas, large areas are planted with maguey and other related Agavae for the production of pulque, the national alcoholic beverage. Like the sisal agave, they are planted at a distance of 3-4 m. apart. Maize, wheat, barley, and beans, according to soil conditions, are planted between the rows while the agave is becoming established. The heart of the plant, before flowering, is deeply cut out with a special instrument and covered with agave leaves or with stones. The liquid (agua miel) which collects is gathered in bottle-shaped gourds and sent to the factory where it is allowed to ferment. From the root of agave a kind of brandy (tequila and mezcal) is made. The maguey is grown on fields where no other crop can be grown. Alfalfa is grown under irrigation and produces 8-10 cuttings a year. Rice growing is important in the states of Michoacan, Morelos and Colima. Maize is often grown with beans. The chick-pea (*Cicer arietinum*) is much esteemed by the Spanish population and is also exported to Spain. Peas and lentils are grown at the higher elevations in the middle states and Irish potatoes near the capital and Pueblo. Sweet potatoes are usually preferred. Sesame and peanuts are grown for edible oil and Ricinus seed for technical and medicinal purposes. Tobacco growing is of ancient date although the curing processes vary widely. The best tobacco comes from the states of Vera Cruz, Tabasco, and Chiapas. Sugar cane and banana growing are of importance in many places.—*J. C. Th. Uphof.*

8299. Schwonder. **Anbauversuche mit Zigarettentabak in den deutschen Schutzgebieten. [Experiments with cigarette tobacco in the German Protectorates.]** Tropenpflanzer **25**: 147-154, 184-189, 222-232. 1922.—Growing of tobacco for cigarettes as conducted in South West Africa is extensively discussed. The writer mentions history, varieties, soil and climatic conditions, sowing, treatment of the plants in the field, diseases and pests, harvest, drying and fermentation.—*J. C. Th. Uphof.*

8300. Segerstad, F. Hård av. [Rev. of: Bolin, Pehr]. **De viktigaste ogräsarternas olika frekvens och relativa betydelse som ogräs inom Sverige. (The different frequency of the**

most important species of weeds and their relative importance as weeds in Sweden.) Meddel. Centralanst. Försöksv. Jordbruks. (Sweden) 239.] Bot. Notiser **1922**: 349–351. 1922.—Thirty-eight weeds were treated, each with a map of distribution in 10 colors, indicating the differences in frequency. These maps were prepared from the answers to a questionnaire letter, from 4,000 farmers. The reviewer questions if such a method could produce a reliable record. He also shows that among the others, the map of *Matricaria Chamomilla* in several cases shows just the opposite to the facts and that those of *Convolvulus arvensis* and *Bromus secalinus* are incorrect. The work also contains maps of groups of species, such as the field mustards: *Sinapis arvensis*, *Brassica campestris* and *Raphanus raphanistrum.* These species being related and in many respects similar, can easily be confused, but they belong to different ecologic associations and should not be treated together. He thinks that the value of the charts is predominantly negative and the elaborate style means wasted money in a time when valuable works, results of many years of scientific investigation, have to remain unpublished on account of lack of funds.—*P. A. Rydberg.*

8301. Shepherd, J. Dawson. **Cotton cultivation in Cyprus.** Cyprus Agric. Jour. **20**: 15–20. 1925.—In practice the cultivation of cotton in Cyprus compares very favorably with that of Egypt. Plowing for cotton growing in Cyprus should precede the rains. Deep plowing is recommended. The seed should be planted on the south side of the ridge facing the longer sun period. It is customary to plant cotton in hills from 30 to 35 cm. apart with rows 70 cm. apart. The cotton boll worm is said now to be present in large numbers in Cyprus cotton fields. Every effort is made to increase early maturity of cotton by sowing seed in February instead of March and by limiting irrigation in July and August.—*W. Stuart.*

8302. Shollenberger, J. H., and J. Allen Clark. **Milling and baking experiment with American wheat varieties.** U. S. Dept. Agric. Dept. Bull. 1183. *1–92. Pl. 1–5, fig. 1–23.* 1924.—Data are presented showing the milling and baking qualities of 75 varieties of wheat as determined from experimental tests made by the U. S. A. Dept. of Agric.—The varieties found to lead in milling and baking quality for the various classes are Marquis, Kota, and Ruby in the Hard Red Spring group; Kubanka in the Durum group; Kharkof, Turkey, and Kanred in the Hard Red Winter group; Red Rock and Fulcaster in the Soft Red Winter group; and Bobs, Hard Federation, Bunyip, and Baart in the White wheats.—Comparison of the qualities of the various classes of wheat shows Hard Red Spring to average highest in loaf volume; Durum, highest in crude protein; Hard Red Winter, highest in yield of flour; and Soft Red Winter, 2nd highest in yield of flour. The White wheats did not excel in any factor, but the best points were high color score and low ash content of flour.—A total of 3,507 samples of wheat of experimental and commercial origin were studied over the 7-year period, 1915–1921. The varietal samples came largely from 36 agricultural experiment stations in the Western U. S. A. where each year several varieties were produced under precisely the same conditions, thus making reliable comparisons with a standard variety of the class possible.—Where comparable samples were thus available, all varieties of Hard Red Spring wheat were compared with the Marquis variety, the varieties of Durum with Kubanka, the varieties of Hard Red Winter with Kharkof, and the varieties of White wheats with Pacific Bluestem. Charts showing differences of the various varieties of the class from these standard varieties are displayed in the bulletin for 8 of the principal milling and bread-making factors including test weight per bushel, crude protein content of the wheat, yield of straight flour, water absorption of flour, volume of loaf, weight of loaf, texture of crumb, and color of crumb. An extensive series of charts also present the average, minimum and maximum results from all varietal samples, and the average for each class, for comparison.—The object of the experimental milling and baking tests was to assist in the promulgation and enforcement of the official grain standards for wheat and to improve the quality of wheat grown. As is indicated by data presented, variety probably has a greater influence than any other factor on the milling and baking value of wheat. The effect of locality and crop year on the quality of the variety Marquis was also determined. The bulletin gives definite information as to the milling and baking qualities of each of the varieties and advises what varieties are best adapted to the different sections of the country.—*J. H. Shollenberger.*

8303. Smith, Forgan. **Power alcohol proposals.** Australian Sugar Jour. **17**: 15. 1925. —The production of power alcohol from molasses supplemented by cassava as a raw material is attracting much attention and plans with this end in view in Queensland are outlined. It is estimated that the yield of cassava, which crop can perhaps be produced more cheaply than sugar cane, would be 8–12 tons per acre and that 1 ton would produce 39 gallons of power alcohol, while 1 ton of sugar cane would produce only 20¼ gallons. According to an opinion, based on reports of officials of the Queensland Department of Agriculture, the relative value of cassava and sugar cane for production of power alcohol is 2 to 1 in favor of cassava.—*Nellie E. Fealy.*

8304. Southee, E. A. **Does fallowing pay?** Agric. Gaz. New South Wales **36**: 238–240. *2 fig.* 1925.—Records from a private farm indicate that in each year except one over a series of years fallowing gave a sufficiently increased income per acre to make the practice economically profitable.—*L. R. Waldron.*

8305. Spangler, R. L. **Ladino clover seed production and the value of ladino as a pasture crop.** Jour. Amer. Soc. Agron. **17**: 84–86. 1925.—Ladino clover (*Trifolium repens* var. *latum*) produced seed and grew well in Idaho.—*F. M. Schertz.*

8306. Spillman, W. J., et al. **Symposium. Economic relations of agronomy.** Jour. Amer. Soc. Agron. **17**: 189–252. 1925.—This symposium includes the following papers: Applications of the law of diminishing returns to agronomic problems, by W. J. Spillman; The economics of fertilizer use in the United States, by Sidney B. Haskell; The economics of soil liming, by John A. Slipher; The economic interpretation of the results of fertility experiments, by E. L. Worthern; Adjustments in standards of living as population increases, by E. G. Montgomery.—*F. M. Schertz.*

8307. Stapledon, R. G., and Rhoda Jones. **Seed mixtures for temporary grass.** Welsh Jour. Agric. **1**: 60–98. 1925.—The paper deals with investigations conducted in Denmark and Sweden and observations on trials of a similar nature in progress at the Welsh Plant Breeding Station, Aberystwyth. Comparatively recent works, chiefly the more important papers of Lindhard published subsequently to 1907 and some of the papers of Witte and other contemporary authors, are briefly reviewed. The individual species have been investigated alone both as spaced plants and in pure plots. In mixtures the behavior of the component species has been ascertained by means of botanical analyses.—The paper, which includes six tables, is divided into the following sections: Nationality and strain trials, behavior of Danish and Swedish strains in Wales, the comparative yielding and other properties of different species of grasses, dates and methods of sowing, the influence of a nurse crop, broadcasting versus drilling, the compounding of seed mixtures, and mixtures for peaty soils. General conclusions are followed by a list of 46 citations of literature.—A critical examination of the literature emphasises the importance of conducting trials on a uniform plan at a great number of centers. The necessity of substantiating all seed mixture work with careful botanical analyses is shown, and also the need for concentrating attention on the habits of growth of various species under different conditions. In regard to mixtures, the prominence given to clovers, even in the case of the longer duration leys, appears to be justified. Simple clover-one-grass mixtures have proved highly successful.—Under Welsh conditions the clover mixture of the Swedish authors is likely to exert an insufficient retarding effect on weeds and bent; probably also it would not develop a sufficiently good grazing sward. The former defect could be counteracted by the addition of Italian rye grass; the latter, by the addition of wild white clover and rough-stalked meadow grass. A general seed formula for 3–5-year leys likely to be suitable to Welsh conditions, is given.—*Authors.*

8308. Stavenhagen, Richard. **Zum Thema Grassamenmischungen. [Mixing seed of grasses.]** Möllers Deutsch. Gärtnerzeitg. **40**: 100–101, 119–121, 167–168. 1925.—General data of a commercial nature are presented. Various grasses and grass mixtures for lawns, tennis courts and pastures are discussed.—*J. C. Th. Uphof.*

8309. Stuart, W. **Como se produce la buena semilla de papa. [How good seed potatoes are produced.]** Agric. [Santiago de las Vegas] **2**: 4–8. 1924.—In this article the author gives a brief review of the extent of the crop and where it is produced in the U. S. A., including also a discussion of the cultural practices and the potato improvement methods employed. The cultural practices are stated to be as varied as are the climatic and soil conditions under which the crop is grown. Crop rotation, preparation of land, fertilization, varieties to grow, treatment of seed, culling, handling, planting, cultivation, spraying, harvesting, storage, grading and marketing are discussed. The potato improvement methods mentioned are those involved in sexual and asexual reproduction. By the former method new combinations of characters may be secured, while from the latter desirable strains, due to sporting or to mutation, may be isolated and propagated.—*Author.*

8310. Stuart, William, P. M. Lombard, Margaret C. Vosbury, G. Corder, W. C. Edmundson, C. F. Clark, and G. W. Dewey. **Size of potato sets: comparison of whole and cut seed.** U. S. Dept. Agric. Bull. 1248. *1–38. Fig. 1–12.* 1924.—The authors emphasize the fact that although size of potato set has served as a subject for investigation during several generations the data obtained are inconclusive.—A rather exhaustive review of previous experimental studies extending from the latter part of the 15th century to the early part of the 20th century is presented, in which it is shown that conflicting results have been obtained. The experimental studies reported by the authors were conducted in 4 different localities; Jerome, Idaho; Greeley, Colorado; Virginia Truck Experiment Station, Norfolk, Virginia; and Caribou and Presque Isle, Maine. In selecting material, care was exercised to secure tubers of even weight. The sizes used were weighed to 6, 5, 4, 3, 2, and 1 ounces respectively. One set was planted whole, while a 2nd set, with the exception of the 1 ounce set, was halved and a 3rd set of 3–6-ounce tubers was quartered. The Irish Cobbler variety was exclusively used in the Virginia tests, the Irish Cobbler and Green Mountain in Maine, the Rural New Yorker No. 2 in Colorado and the Charles Downing and Russet Burbank in Idaho. These investigations extended through 6 seasons in Virginia, 5 in Maine, 3 in Colorado and 4 in Idaho. The authors' conclusions are that the successful determination of the most profitable size of set to use, and whether the set should consist of whole or cut seed, primarily involves a careful study of the proper spacing to give each size of set in order to obtain a maximum yield. The data clearly show also that abundance of moisture and plant food throughout the growing season insures a maximum crop from whole and large sized cut sets, whereas lack of these 2 factors favors medium sized cut sets because fewer tubers are produced, resulting in their having a better chance to reach marketable size. A definite relation was found between the size of the set used and the number of stems and tubers produced to the set. The stem frequency correlations in the Maine studies show that as the weight of whole seed increases from 2 to 6 ounces the stem frequency shifts from 3 stems in the case of 2-ounce sets to 7 stems from 6-ounce sets. In halved sets the shift was from 2 to 4 stems; while in the quartered sets it made no difference whether they were cut from 3, 4, 5, or 6 ounce tubers, the greatest number of sets producing two stems. Slight changes were noted in the Virginia data in which the whole sets shift from 3 to 5 stems, halved sets from 2 to 3 and quartered sets from 1 to 2. Stem-frequency correlations are graphically depicted.—*W. Stuart.*

8311. Subramanyam, N. **Korai grass cultivation in Karur taluk.** Jour. Madras Agric. Students Union **12**: 154–156. 1924.—Cultivation methods and preparation of the produce are described for a species of *Cyperus* which yields material for mat making.—*P. S. Jivanna Rao.*

8312. Sutton, Geo. L. **Lucerne—The queen of fodder crops.** Jour. Dept. Agric. Western Australia 2nd Ser. **1**: 396–413. *7 fig.* 1924.—This paper consists of practical suggestions for growing and handling the crop.—*P. J. Olson.*

8313. Sutton, Geo. L. **Maize—the king of fodder crops.** Jour. Dept. Agric. Western Australia 2nd Ser. **1**: 249–260. *5 fig.* 1924.—This is a popular discussion of cultural methods as applied to maize and of the value and importance of the crop.—*P. J. Olson.*

8314. Tabor, Paul. **Permanent pastures for the northern half of Georgia.** Georgia State Coll. Agric. Bull. 261. *1–28. 14 fig.* 1922.—The principal pasture plants adapted to the northern half of Georgia are Lespedeza (*Lespedeza striata*), Bermuda grass (*Cynodon dactylon*) for both hill and bottom lands, Dallis grass (*Paspalum dilatatum*), white clover (*Trifolium repens*) for bottom lands and rich uplands, and carpet grass (*Axonopus compressus*) for bottom lands south of Atlanta, Athens and Elberton. The bulletin further discusses and describes bur clover (*Medicago arabica*), black medic (*Medicago lupulina*), kudzu (*Pueraria thunbergiana*), sour clover (*Melilotus indica*), sweet clover (*Melilotus alba*), vetch (*Vicia* spp.), crimson clover (*Trifolium incarnatum*), red top (*Agrostis alba*), orchard grass (*Dactylis glomerata*) and Kentucky blue grass (*Poa pratensis*). Some of the native grasses that may be found of use, pasture control and the rate of seeding of various mixtures for the production of best results, and some of the common weeds found in Georgia pastures are also discussed.—*T. H. McHatton.*

8315. Tabor, Paul. **Soy beans for Georgia.** Georgia State Coll. Agric. Circ. 90. *1–4. 1 fig.* 1923.—The cultivation of soy beans for Georgia conditions is discussed. Four varieties are recommended for use in this state: Laredo and O-too-tan for hay, and the Mammoth Yellow and Southern Prolific for seed.—*T. H. McHatton.*

8316. Talmage, H. R. **How can best strains of a variety of seed potatoes be located and maintained?** Proc. 11th Ann. Meeting Potato Assoc. America **1924**: 15–20. 1925.—The author states that for the past 13 years he has made a practice of visiting the northern seed potato producing sections during the growing season with a view to locating the best strains of seed stock. For 11 years he has conducted a Green Mountain seed test of from 8 to 20 strains, on his own seed farm. Some strains have been found to mature earlier than others. It has been found that on Long Island certain strains of seed can be relied upon to give a good yield, while other strains never produce a high yielding crop. The maintenance of a good strain of seed from year to year is possible through the selection of desirable yielding plants and the planting of a seed plot where careful roguing can be practised. The author believes that the problem of securing healthy seed potatoes is fairly well solved but he considers the problem of locating vigorous high-yielding seed stocks a much more difficult one.—*W. Stuart.*

8317. Thomas, I. **Experiments with cotton at the Chapman Experiment Farm.** Jour. Dept. Agric. Western Australia 2nd Ser. **1**: 328–329. 1924.—This experiment was planned for the purpose of determining the earliest date at which cotton could be sown. It is pointed out that the advantage of early sowing consists in the presence of more moisture than is normally available to the crop when sown later. It was found that sowing prior to September was unsuccessful because the soil was too cold to permit germination, although there was abundant moisture at this time. By September the ground was warm enough to permit germination but the air temperature was too cold for vigorous growth. Later, the temperature was high enough for satisfactory growth but the moisture was deficient.—*P. J. Olson.*

8318. Thomas, I. **Experiments with lupins at the Chapman Experiment Farm.** Jour. Dept. Agric. Western Australia 2nd Ser. **1**: 414–419. *3 fig.* 1924.—The following conclusions are drawn: (1) Shallow planting is essential. Sowing at a depth of 1 inch gives better results than sowing at 3 inches or at the surface. Surface sowing is, however, far superior to sowing at a depth of 3 inches. (2) Early sowing gives best results. (3) Application of potash is without beneficial effect. (4) Liming is unnecessary on the soils under experiment.—*P. J. Olson.*

8319. Tobler, F. **Englische Ratschlage zur Sisalgewinnung in Ostafrika. [English advices on sisal growing in East Africa.]** Tropenpflanzer **26**: 80–85. 1923.—Outside of Central America, sisal hemp is profitably grown in Java and German East Africa, both localities producing commercial fibers. The views of L. A. Notcutt, from "Tropical Life," are presented.—*J. C. Th. Uphof.*

8320. Tobler, F. **Über die Aufschliesung tropischer Bastfasern. [Separation of tropical fibers.]** Tropenpflanzer **27**: 132–137. 1924.—Fibers are separated (1) mechanically, (2) chemically and (3) biologically (by the use of micro-organisms). The 3 processes are described in detail.—*J. C. Th. Uphof.*

8321. Uphof, J. C. Th. **Der Anbau von Zuckerrohr auf Cuba. [Growing sugar cane in Cuba.]** Tropenpflanzer **27**: 1–7. *1 fig.* 1924.—Sugar production during 1922 was 4,133,550 tons. Conditions of soil and climate, clearing of land and agricultural implements are described. After the 2nd planting the land should be put into a meadow and grazed for 2–3 years. At the end of that time the land is disc-harrowed or, if the grass is too thick, it is plowed. Velvet beans are an important green manure and are plowed under in autumn. On new land, cane is sometimes planted 6 × 6 feet, on old land 5 × 5 feet apart. Production is about 70,000 arrobas per cabilleria (1 arroba = 25 pound) and (1 cabilleria = 13½ ha.). The principal varieties are Cristallina, Blanca and Rose Bamboo.—*J. C. Th. Uphof.*

8322. Uphof, J. C. Th. **Die Anzucht des Tabaks in Saatbeeten auf Kuba. [Sowing tobacco in beds in Cuba.]** Tropenpflanzer **27**: 158–159. 1924.—A description is given of sowing tobacco in Cuba under the shade of oiled cloth. The soil in the beds is at first superficially disinfected with hot water. Thirty to thirty-five days after sowing the young seedlings can be transplanted to the field.—*J. C. Th. Uphof.*

8323. Uphof, J. C. Th. **Die Bewirtschaftung der Naturwiesen und Steppen in halbtrockenen Gegenden des Südwesten von Nordamerika. [Management of grazing ranches in the semi-arid regions of southwestern North America.]** Tropenpflanzer 28: 48–64. *1 fig.* 1925.—Conditions are described as to the protection and management of wild fodder plants on the grazing ranches of the southwestern U. S. A. The behavior of native plants under proper conditions and under those of overgrazing is discussed. *Yucca elata* is used as a fodder plant for cattle during long spells of drouth while by burning with torches the spiny, native cacti are made edible for cattle. —*J. C. Th. Uphof.*

8324. Ward, F. E. **Sugarbeet trials in Canterbury, season 1923–1924.** New Zealand Jour. Agric. 29: 340–341. *1 fig.* 1924.—This is a report of repeated trials to determine the possibility of sugar beet growing in Canterbury, New Zealand. The crop was unsatisfactory in the season 1923–1924 due to late arrival of the seed and extreme dryness of season.—It was found that the best method of planting was in drilled rows 18–21 inches apart, using 8–10 pounds of seed per acre. A variety trial at Kaiapoi indicated that suitable types for growing were Wibolths Danish Improved and Wanzelban, while Rose Giant and White Giant were not suited for local conditions.—*Peter J. Klaphaak.*

8325. Watkins, W. R., et al. **Farmers' experiment plots. Potato trials, 1924.** Agric. Gaz. New South Wales 36: 269–279. 1925.—These trials were conducted upon 19 farms in 4 different regions. Notes are given relative to soil characters, methods of cultivation and seasonal conditions. The variety Satisfaction gave the maximum yield of 500 bushels per acre. Late blight reduced the yields upon certain of the farms.—*L. R. Waldron.*

8326. Wenholz, H. **Agriculture in the Tumut and Murrumbidgee valleys.** Agric. Gaz. New South Wales 36: 283–287. 1925.—The subject is dealt with in a general way, some emphasis being placed upon the crops of maize and alfalfa.—*L. R. Waldron.*

8327. Wenholz, H. **Maize-growing for silage. A competition at Tilba.** Agric. Gaz. New South Wales 36: 241–252. *2 fig.* 1925.—This crop is discussed from the standpoint of systems of cropping, cultivation methods, varieties, rate of seeding, insect pests and diseases, and the improving of soil fertility. Six farms entered into the competition. One (calculated) yield of 45 tons of (green) fodder per acre was secured.—*L. R. Waldron.*

8328. Werner, H. O. **Potato production in the northern great plains region.** Potato News Bull. 2: 232–239. *4 fig.* 1925.—Geographically, the region discussed includes western Nebraska and parts of Colorado, Wyoming, Montana, and North and South Dakota. The essential features of potato production, including rotations, varieties, cultural practices, storage and diseases are stated.—*F. Weiss.*

8329. Werner, H. O. **Report of seed potato improvement committee.** Proc. 11th Ann. Meeting Potato Assoc. America 1924: 130–136. 1925.—This report notes the increasing importance of seed certification work, and the constant efforts being put forth to raise the standard of certified seed. In 11 states the certification work is administered by the agricultural college. In 5 others the college of agriculture does not certify the seed but does take a hand in setting standards and conducting inspections. The state department of agriculture administers the work in 7 states; while in 3 others an association does the certifying. About $\frac{1}{3}$ of the inspection agencies require the planting of certified seed, while seed disinfection is either required or recommended by $\frac{1}{2}$ of them. Some inspection services disqualify fields if they give evidence of careless cultural practices. Most agencies now require 2 field inspections. In 4 states 3 regular field inspections are given. Practically all certified seed must meet the minimum requirements of U. S. #1 Grade. A few states have adopted special grades, others have established 2 or more grades or classes of seed stock. North Dakota has established 3 grades, "Pedigreed Seed," "Improved Seed," and "Non-Certified Seed." Oregon has "Certified" and "Standard" seed. Seed trial plots are recommended. The committee, through Chairman Werner, sums up the seed certification work as regards noticeable changes or advancement as follows: (1) Increased number of field inspections, (2) improved grading of certified seed, (3) more rigid control of virus diseases because of better knowledge of symptoms and control, (4) use of trial plots for checking the quality of the work and efficacy of the standards, also as a direct aid to the actual inspection work, and (5) very great increase in the volume of certified seed produced.—*W. Stuart.*

8330. Weston, J. W. **Size of seed piece and distance of spacing.** Potato News Bull. **2:** 151–152. 1925.—This gives the results of an experiment carried out in upper Michigan with White Rurals to determine the most effective size of seed piece and planting distances, using the same amount of seed per acre. Twelve-inch spacing gave a much larger total yield and yield of marketable tubers than greater distances.—*F. Weiss.*

8331. White, C. T. **Two valuable fodder trees.** Queensland Agric. Jour. **22:** 352–356. *Pl. 109–111.* 1924.—Illustrations, origin and fodder value of *Phytolacca dioica* Linn. and *Celtis sinensis* Pers. are given.—*W. D. Francis.*

8332. White, C. T. **Weeds of Queensland, No. 37.** Queensland Agric. Jour. **23:** 96–97. *Pl. 22.* 1925.—The distribution, characteristics and method of eradication of *Martynia lutea* Lindley are outlined and the species is illustrated by a drawing.—*W. D. Francis.*

8333. White, C. T. **Weeds of Queensland, No. 38.** Queensland Agric. Jour. **23:** 200–201. *Pl. 44.* 1925.—The characters, distribution and properties of *Bassia Birchii* are outlined.—*W. D. Francis.*

8334. White, G. C., W. L. Slate, Jr., L. M. Chapman, and B. A. Brown. **A comparison of early, medium and late maturing varieties of silage corn for milk production.** Storrs [Connecticut] Agric. Exp. Sta. Bull. 121. *173–211.* 1924.—In milk production, mature silage is superior while immature silage is inferior and medium mature silage is intermediate. The varieties used are Pride-of-the-North, Eureka and Leaming. The milk production is in the exact order of the dry matter content of the varieties. The late and medium varieties produce larger acre-yields and consequently an acre of silage from these varieties will produce more milk. When an acre of early corn yields 69% as much as late corn and an acre of medium corn yields 85.6% as much per acre as late corn the 3 varieties are found to be equal the one to the other in milk production per acre. These varieties contained 31.46, 25.24 and 20.93% each of dry matter when harvested. The dry matter of the silages at feeding time was slightly lower, being 29.05% for early silage, 24.73% for the medium silage and 19.67% for the late silage corns. The losses are in the nitrogen-free extract. There were rather wide fluctuations in the composition of the silage in the silo.—*Henry Dorsey.*

8335. Whittet, J. N. **Top-dressing pastures. Results of trials in various parts of the state.** Agric. Gaz. New South Wales **36:** 335–345. *11 fig.* 1925.—Extensive mineral fertilizing trials were conducted at 14 different localities. In each locality the fertilizers were applied in different mixtures and at different rates. The plant constituents are given for each pasture experimented upon. It was found that top-dressing of pastures was generally a profitable procedure. In the drier areas 50 pounds of superphosphate per acre was found sufficient, residual effects often being noticed. Top-dressing of pastures tended toward the disappearance of weeds and a more prolonged green period of the cover material.—*L. R. Waldron.*

8336. Willard, C. G. **The time of harvesting soybeans for hay and seed.** Jour. Amer. Soc. Agron. **17:** 157–168. 1925.—Soybeans should be cut for hay from the time the beans are well formed until they are half grown. The yield of seed increases slowly, then very rapidly for 1–2 weeks, then more slowly until maturity. About 40% of the mature crop is seed.—*F. M. Schertz.*

8337. Winters, R. Y. **Report of field crop section.** Ann. Rept. North Carolina Agric. Exp. Sta. **47:** 29–35. 1924.—This report contains a brief statement of results on dates of planting oats and wheat, and improvement of cotton, soybeans, and small grains by seed selection. In addition, mention is made of special studies with cotton, which include such factors as density of fiber population, distribution of fibers and length, diameter and tensile strength measurements and correlations—*F. A. Wolf.*

8338. Wise, F. J. S. **Broom millet.** Jour. Dept. Agric. Western Australia 2nd Ser. **1:** 262–265. *2 fig.* 1924.—This is a popular paper giving cultural directions as applied to the crop known in America as broomcorn.—*P. J. Olson.*

8339. Wunder, B. **Baumwollenbau und -Züchtung in Deutsch-Ostafrika. [Growing and breeding of cotton in German East Africa.]** Tropenpflanzer **26:** 111–118. 1923.—Conditions of soil and climate in various parts of former German East Africa are described in relation to cotton growing. The upland types have proved to be better than the sea-island types. Tables are given as to production, length of stems and fibers, etc., of various strains of cotton.—*J. C. Th. Uphof.*

SOIL SCIENCE (EDAPHOLOGY)

8340. Anonymous. **Recent developments in the nitrogen-fixing industry.** Nature **115**: 465–466. 1925.—This is a brief review. The writer concludes that the probable exhaustion of natural deposits in a generation or two at most and the use of the products in manufactures assures a great development of the industry.—*O. A. Stevens.*

8341. Anonymous. **Sugar planter's field day at Empangeni.** South African Sugar Jour. 9: 235, 237. 1925.—Fertilizer experiments at the South African Sugar Association Experiment Station, which are described, indicate that "there appears to be no doubt that phosphate is the dominant fertilizer requirement for nearly all South African soils."—*Nellie E. Fealy.*

8342. Adams, A. B. **Phosphatic fertilizers as manures for grass lands.** Jour. Dept. Agric. Western Australia 2nd Ser. **1**: 452–455. 1924.—This is an introductory article to be continued in future issues. The present installment deals with general soil requirements and differences as regards availability between certain carriers of phosphorus.—*P. J. Olson.*

8343. Adinarayana Rao, K. **Organic manures—availability of plant food.** Year Book Madras Agric. Dept. **1923**: 54–60. 1924.—The author describes experiments carried out by means of nitrification tests at Coimbatore in regard to the availability of different organic manures.—*P. S. Jivanna Rao.*

8344. Albert. [Rev. of: Puchner, Heinrich. **Bodenkunde für Landwirte.** (**Soil science for agriculturalists.**) *710 p. 5 pl., 212 fig.* Ferdinand Enke: Stuttgart, 1923.] Deutsch. Forstzeitg. **40**: 376–377. 1925.—This book, which is compared favorably with Ramann's classic work, treats some phases of the subject more fully than Ramann, and should be as useful to all students of soils as to agriculturists. The chapter on colloid chemistry and its application to soil science is especially commended.—*W. N. Sparhawk.*

8345. Alford, J. S. **Fertilizers from sewage sludge.** Surveyor **66**: 388. 1924.—Brief discussion of use of sewage sludge as fertilizer. Chemical fertilizers do not furnish humus, which must be derived from animal manures. Research on methods of rendering available the plant food in sewage sludge is suggested.—*Rudolph E. Thompson* (*From Public Health Engineering Absts.*).

8346. Allison, F. E., J. M. Braham, and J. E. McMurtrey, Jr. **Field experiments with atmospheric nitrogen fertilizers.** U. S. Dept. Agric. Bull. 1180. *1–43. Pl. 1–14, fig. 1–4.* 1924.—The results of 3 years of field experiments with 10 atmospheric nitrogen fertilizers used chiefly on corn and cotton, are given. These materials included cyanamid, ammonium nitrate, double salt made from ammonium nitrate and ammonium sulphate, 2 mixed salts made from ammonium nitrate and either potassium chloride or potassium sulphate, ammonium phosphate, ammoniated superphosphate, ammonium chloride, urea and urephos made by treating cyanamid with sulphuric acid and neutralizing with ground phosphate rock. Under the conditions tested, all of the materials except cyanamid were of about the same fertilizer value as sodium nitrate and ammonium sulphate. Cyanamid usually was not as satisfactory as the other sources of nitrogen, largely because so many factors influence the rate and manner in which the material is decomposed either in fertilizer mixtures or in the soil. Under unfavorable conditions, a considerable portion of the cyanamid nitrogen is transformed into dicyanodiamide, a compound which is only very slowly available as a source of nitrogen and toxic for some crops and for the nitrifying bacteria. The use of cyanamid on corn gave much better results than on cotton, probably for the reason that corn can utilize ammonia nitrogen while cotton requires nitrates for its best growth. It was found that cyanamid may be used satisfactorily in mixture with calcined phosphate or basic slag; if used with acid phosphate, the 2 materials should be applied separately.—*F. E. Allison.*

8347. Anderson, M. S., W. H. Fry, P. L. Gile, H. E. Middleton, and W. O. Robinson. **Absorption by colloidal and noncolloidal soil constituents.** U. S. Dept. Agric. Dept. Bull. 1122. *1–20.* 1922.—Soil forming minerals, which make up the noncolloidal part of the soil, show characteristic absorptive capacities for different substances. Several of the most abundant minerals in soils, such as quartz and the feldspars, absorb practically no malachite green, water vapor or ammonia, while the absorptive powers of soil colloids are relatively high. It is calculated from the absorption of mineral powders and the mineralogical compositions of soils that, as a rule, less than 5% of the total absorption of the soil is due to the noncolloidal part. With respect to absorptive capacities, the soil colloids appear to resemble synthetic inorganic gels more closely than finely comminuted minerals.—*M. S. Anderson.*

8348. Baker, W. G. **Residual effects of acid phosphate and rock phosphate.** Jour. Amer. Soc. Agron. **17:** 172–186. 1925.—A report of the study of experiment station reports, greenhouse tests, and field tests covering 2–8 years. The rate of exhaustion in 44% acid phosphate was 12.3% the 1st year, 8.9% the 2nd year and 7.1% the 3rd year, or a total of 28.3%.—*F. M. Schertz.*

8349. Boehne, G. **Harnstoff ein neues Düngermittel für de Gartenbau. [Urea a new manure in horticulture.]** Möllers Deutsch. Gärtnerzeitg. **40:** 46–47, 55–56, 74. 1925.—The use of synthetic urea as a fertilizer for horticultural plants is discussed. The beginner should use it in a solution of 1 gm. of urea to 1 liter of water. The solution should be applied not oftener than twice a week. Care should be taken that the leaves of the plants are not moistened by the solution. After an application the leaves of plants become dark green, flowers develop and the quality of the fruit improves. In large horticultural establishments, vineyards and on tobacco lands powdered urea should be used. Transplanted young plants show marked effects from this fertilizer. The powdered urea should be scattered over the surface and hoed or harrowed into the soil at once. Roses, fruit trees, lilacs and conifers should receive 2 applications, the latter not later than the early part of summer in order that the wood may have time to ripen properly. The application may vary from 10 to 30 gm. per square meter depending upon the condition of the soil, and care should be taken not to use an excessive amount.—*J. C. Th. Uphof.*

8350. Brown, B. E. **Concentrated fertilizers.** Potato News Bull. **2:** 185–189. 1925.—The historical trend from low grade fertilizers containing less than 14 units of plant food per ton to standardized high grade fertilizers containing 16 to 20 units, is traced. On the promise of effecting considerable further savings in transportation and handling costs, fertilizers composed of highly concentrated carriers of plant food such as urea, potassium and ammonium phosphate, ammonium nitrate, etc., are being experimentally tested. The crops, sites and cooperating agencies involved in this experimentation are named, and the principal objects of the tests stated.—*F. Weiss.*

8351. Carter, L. M., M. W. Lowry, W. O. Collins, and R. M. Soule. **Analysis of soils of Early County.** Georgia State Coll. Agric. Bull. 289. *1–48. 3 fig.* 1923.—This report gives a general description of the soils with their chemical analyses and locations in Early County, Georgia, and includes an outline of the general agricultural conditions of that community.—*T. H. McHatton.*

8352. Carter, L. M., M. W. Lowry, W. O. Collins, and R. M. Soule. **Analysis of soils of Floyd County.** Georgia State Coll. Agric. Bull. 277. *1–72. 4 fig.* 1923.—This report presents a general description of the soils with their chemical analyses and locations in Floyd County, Georgia, and gives an outline of the general agricultural conditions of that community.—*T. H. McHatton.*

8353. Carter, L. M., M. W. Lowry, W. O. Collins, and R. M. Soule. **Analysis of soils of Madison County.** Georgia State Coll. Agric. Bull. 268. *1–36. 4 fig.* 1922.—This bulletin presents a general description of the soils with their chemical analyses and locations in Madison County, Georgia, and includes an outline of the general agricultural conditions of that community.—*T. H. McHatton.*

8354. Carter, L. M., M. W. Lowry, W. O. Collins, and R. M. Soule. **Analysis of soils of Richmond County.** Georgia State Coll. Agric. Bull. 293. *1–47. 4 fig.* 1924.—This bulletin presents a general description of the soils with their chemical analyses and locations in Richmond County, Georgia, and gives an outline of the general agricultural conditions of that community.—*T. H. McHatton.*

8355. Clarke, G. R., and C. G. T. Morison. **Losses of ammonia from soil by volatilization.** Nature **115:** 423–424. 1925.—Preliminary experiments are reported in which losses of 0.5 to 1.5 parts per million were detected.—*O. A. Stevens.*

8356. Davis, L. V. **Use of agricultural lime in Georgia.** Georgia State Coll. Agric. Bull. 271. *1–20. 5 fig.* 1922.—The author concludes that the majority of Georgia soils need lime and that it is an important means of soil improvement. The term agricultural lime refers to lime oxide, lime hydrate and lime carbonate. Lime should be applied after plowing and before harrowing. For the soils in Georgia 2,000–3,000 pounds of lime carbonate, or its equivalent, should be applied every 2–3 years.—*T. H. McHatton.*

8357. Gaarder, Torbjørn, og Oscar Hagem. **Nitrifikation in sauren Lösungen. [Nitrification in acid solutions.]** Bergens Mus. Aarb. **1922–1923**[1]: Naturvidensk. Række No. 1. *1–26.* 1924.—In a previous paper (Versuche über Nitrifikation und Wasserstoffionenkonzentration Ibid. 1919–1920) the authors stated that the H-ion concentration of the medium plays a deciding role in the bacterial development of nitrates and nitrites, the nitrite bacteria having an optimal pH of 7.7–7.9, the optimal for developing nitrites into nitrates being 6.8–7.3. The possibility that there are several races of nitrifying bacteria was then emphasized, and the present paper was based upon a large number of nitrification experiments at different H-ion concentrations. Four types of soil were chosen, namely: black, humid, peaty soil; soil from potato field; soil from light fir forest; and soil from Callunaheath. The buffers used were M/15 Na_2HPO_4 and M/15 KH_2PO_4 solutions. There are different races of bacteria adapted to different H-ion concentrations, and in the present work the authors have distinguished 3: Bacterium α, having an optimum at pH 7.7–7.9 and an acidity limit at pH 7.0–7.1; β, 6.8–7.0, acidity limit pH 6.6; γ, 6.5–6.6, acidity limit, 6.0–6.1. The last named bacterium is probably composed of 2 races, and in subsequent experiments nitrification was also observed under much more acid conditions (pH 4.8–5.5–6.1) indicating in all probability a number of different nitrifying bacteria. Consequently, it is not sufficient to use an ordinary Winogradsky solution for determining the nitrificating possibilities of a soil. In treating a soil with lime the bacterial content as well as the acidity must be known. —*K. Münster Strøm.*

8358. Gile, P. L., H. E. Middleton, W. O. Robinson, W. H. Fry, and M. S. Anderson. **Estimation of colloidal material in soils by adsorption.** U. S. Dept. Agric. Dept. Bull. 1193. *1–41.* 1924.—In this investigation the total colloidal material in the soil is estimated by determining the adsorptive capacities of both the whole soil and a sample of colloidal material isolated from the soil. The ratio of the 2 adsorptive capacities multiplied by 100 is taken as the percentage of colloid in the soil. The results by this adsorption-ratio method are checked against the method of isolating as much colloid as practicable and estimating microscopically the remainder of difficultly extractable colloid. The accuracy of the adsorption-ratio method when malachite green, water, and ammonia vapor are adsorbed is investigated. The 32 soils examined contained from 6 to 70% of colloidal material. The errors of earlier estimates of the colloid contents of soils are discussed.—*W. H. Fry.*

8359. Hardenburg, E. V. **Soil type as a factor in seed potato production.** Proc. 11th Ann. Meeting Potato Assoc. America **1924**: 95–101. 1925.—Emphasis is placed upon the necessity of a proper appreciation of the response of the plant to climate and soil. In potatoes, soil type influences set of tubers, shape of tuber, time of maturity, yield, and eating quality. Experimental data by Pieper, Witte, Krantz, Edmundson, Clark and Tolaas are cited to substantiate the author's theses and to give additional weight to his own data. Three varieties of potatoes, Rural, Green Mountain and Irish Cobbler, were used. The Rural was planted on sandy loam and heavy silt loam at Ithaca, the Green Mountain on muck and stony silt loam at Marion and the Irish Cobbler on peat and light sandy loam at Kirkville, New York, ⅛ acre plots being used in each locality. Tuber counts were made on 144 plants from each plot soon after the blossom period in order to secure data on number of tubers actually set prior to the decomposition or absorption of many of them later in the season. Both total and marketable yields from the remaining plants were recorded after maturity. Data were taken on maximum height of plant, number stalks per hill, number tubers per plant, average weight per tuber in ounces, total yield per acre in bushels, and percentage of primes. The tuber set was found to be higher in the lighter than in the heavier soils. Peat-grown Irish Cobbler seed potatoes consistently came up a few days earlier than those from seed produced on sandy loam soil. The author believes that vigor and tuber set in the seed crop may be transmitted to the following crop.—*W. Stuart.*

8360. Lipman, Jacob G., and Augustine W. Blair. **Report of the department of soil chemistry and bacteriology.** New Jersey Agric. Exp. Sta. Ann. Rept. **44**: 213–229. 1923 [1924].—A brief review of activities under various projects. A study was conducted to determine the influence of the phosphoric acid-potash ratio on the availability of nitrogen in nitrate of soda, dried blood, ammonium sulphate and a combination of the three. Barley was grown as a main crop and sorghum as a residual crop. For the barley, the nitrogen-treated cylinders showed a distinct increase in yield over the checks. Nitrate of soda gave the highest yields and the highest percentage of nitrogen recovery; ammonium sulphate, the lowest. The recoveries with dried blood and with the combination of the 3 materials were about the same. In most cases an increase in the phosphoric acid ratio from 1 to 2, gave increased yields of grain and straw, while a further increase did not materially increase the yields. Varying the amount of phosphoric acid and potash had practically no effect on the percentage of nitrogen and phosphoric acid in the grain and straw. For the residual crop the nitrogen-treated cylinders, with slight exception, showed some increase in yield over the checks, while increasing the phosphoric acid or potash increased the yields but little nor did a change in the ratio of these 2 materials materially change the percentage of nitrogen and phosphoric acid in the crop.—Wheat and rye have been grown continuously on 4 plots since 1909, 2 of which receive no nitrogen, while the remaining 2 are planted with soybeans or cowpeas which are plowed under for the succeeding wheat or rye crop in the fall. All plots receive yearly applications of acid phosphate and potash, and lime every 5 years. In 1922, the legume plots showed an increase of about 4 bushels of grain per acre over the check plots, even though the latter were influenced by volunteer clover. The legume rye plots show an increase in total nitrogen of nearly 18 pounds per acre and the legume wheat plots an increase of about 13 pounds over the rye and wheat plots.—In a continuous corn experiment to compare a legume and non-legume green manure crop and the influence of small applications of manure as a means of introducing decay organisms in the soil, the legume section gave 10 bushels of grain more than the non-legume section and the total nitrogen recovered was about 10 pounds per acre greater. The influence of the manure was somewhat obscured by the green manure crop. On the non-legume section the manure had a distinct effect on the yield of grain and stalks as well as on the total nitrogen recovered in the crop.—Soybeans have been grown on limed and unlimed plots continuously since 1913. No nitrogen has been applied in this time but moderate applications of acid phosphate and muriate of potash are made annually. In 1922 the unlimed plots gave an average yield of 3 bushels as compared with an average of 21.2 bushels for the limed. The total nitrogen recovered from the former was 14.8 pounds per acre as compared with 92.8 pounds for the latter. The average yield of dry stalk was about 1850 pounds for the limed and 334 pounds for the unlimed plots.—*Wm. H. Martin.*

8361. McCrory, Samuel H., Forest V. King, Guy Ervin, and O. Louise Evans. **A bibliography relating to soil alkalies.** U. S. Dept. Agric. Dept. Bull. 1314. *1-40.* 1925.—The references contained in this bulletin were compiled in connection with an investigation by the Bureau of Public Roads of the effect of soil alkalies on concrete drain tile. The bibliography is fairly complete in respect to articles published prior to 1924. The references are divided into 6 classes as follows: (1) Soil alkalinity—origin, distribution, physical and chemical properties and treatment; (2) alkali soil salts—effects on mortar and concrete and measures for prevention; (3) sea water—effect on mortar and concrete and measures for prevention, sea water structures of concrete; (4) other injurious agents—effects of sewage, acids, soils and various chemicals on mortar and concrete, measures for prevention; (5) waterproofing concrete; and (6) alkali-resistant concrete—special ingredients and methods and incidental effects of same.—*S. H. McCrory.*

8362. Marchand, B. de C. **Representative Transvaal soils. VIII. The Waterberg sandy soil.** Jour. Dept. Agric. Union of South Africa **9**: 81–84. 1924.—This soil type occurs in the Waterberg, Middelburg and Pretoria districts, and probably in the districts of Rustenburg and Zoutpansberg. It is almost invariably brown in color, though occasionally shading off into a grayish brown. The texture is loose and sandy and as a rule some coarse gravel of a reddish brown color may be observed, more especially at depths of 10 inches or more.—Chemically, the soils are poor, being usually decidedly acid, but low in organic matter. Lime is lacking and there is a deficiency in phosphoric oxide, the availability of which is also low. The nitrogen content is very low, being less on the average than in the other sandy soils of this series.—Cattle manure has proved inefficient, and must be supplemented by artificial manures, especially phosphates. Superphosphates will probably prove the best phosphatic manure to use, though bone-meal might be substituted when obtainable at a comparable price.—A great variety of crops is grown on the Waterberg sandy soil; maize, wheat, oats, barley, teff, lucerne, peanuts, tobacco and potatoes have all been stated to do fairly well when manured. Suitable crop rotations for this soil type are given.—*L. I. Goldblatt.*

8363. Marloth, R. **Notes on the determination of the acidity of the soil by various methods, namely the hydrogen ion concentration, Truog's (sulphide of zinc) and Comber's reagent (Potassium thiocyanate).** South African Jour. Sci. **21**: 270–274. 1924.—Soils of the highly siliceous class investigated do not give reliable results by the Comber reagent; for the farmer the Truog test is convenient and sufficiently accurate. For the chemist who has a laboratory at his disposal the measuring of the H-ion concentration of the soil suspension either electrically or colorimetrically would be equally practicable and expeditious.—*Author.*

8364. Mathews, O. R., and E. C. Chilcott. **Storage of water in soil and its utilization by spring wheat.** U. S. Dept. Agric. Dept. Bull. 1139. *1–26. Fig. 1.* 1923.—This bulletin is a study of the depth to which the wheat crop utilized the soil in 135 crop years at 17 stations on the Great Plains (U. S. A.). The data are classified to show whether this depth was limited by the depth of the soil, by the quantity of water available for storage, by the physiological limitations of the crop, or by the character of the season. With knowledge of the field-carrying capacity and the minimum point of exhaustion of each soil unit, soil moisture data are utilized to classify into 5 groups the extent to which each foot section of soil functioned each year. Differences in cultural methods on land producing a crop each year were not found to be sufficient to cause major differences in the depth of soil utilized, but alternate fallowing and cropping increased such depth. It was found that 6 feet of soil may function in the growth of spring wheat, but that the 5th and 6th foot sections contribute very little to the total quantity of water used by the crop. In about 90% of the years covered by the investigations the soil within the zone of normal root development was dry at harvest time. The authors conclude that the utilization of a large soil mass is not essential to a high yield.—*O. R. Mathews.*

8365. Merz, Albert R., and William H. Ross. **The computation of fertilizer mixtures from concentrated materials.** U. S. Dept. Agric. Dept. Bull. 1280. *1–16. Pl. 1–4.* 1924.—A method is presented whereby it can be quickly ascertained by means of triangular diagrams whether a mixed fertilizer of given analysis formula can be made from combinations of 2-fertilizer-constituent materials. Formulas are given for the computation of the respective quantities of these materials required for making mixed fertilizers in those cases in which the fertilizer can be made from these materials. Tables are presented giving the results of such computations for the 52 analysis formulas adopted by conferences of agronomists and fertilizer manufacturers as standard for the 24 states represented.—*Albert R. Merz.*

8366. Merz, Albert R., and William H. Ross. **The recovery of potash as a by-product in the blast-furnace industry.** U. S. Dept. Agric. Dept. Bull. 1226. *1–21.* 1924.—The weighted average of the potash in the ores, coke, and limestone used in the blast-furnace industry amounts to approximately 0.2% for each material, which is less than ⅓ as great as that found for the raw mix used in the cement industry. In the case of the ores, the potash ranges from 0.04% for Mesaba ores to over 2% for certain foreign ores. As the consumption of high-potash ores is relatively small as compared with low-potash ores, the weighted average of the potash in the ores consumed is less than the mean average found for different ore samples. The total potash in the ore, coke, and limestone used in blast furnaces amounts, respectively, to 7.3, 4.1 and 1.7 pounds per ton of pig iron, or to a total of 13.1 pounds. The potash in the slag amounts to 8.2 pounds, which leaves a balance for the potash volatilized of 4.9 pounds per ton of pig iron. This amounts to a total for all plants of about 84,000 tons annually, as compared with 87,000 tons for the cement industry.—*Albert R. Merz.*

8367. Neller, J. R. **Sulfofication and its effect upon the oxidation of organic matter in eastern Washington soils.** Jour. Amer. Soc. Agron. **17**: 40–48. 1925.—When supplied with sufficient moisture, the arid and semi-arid soils of eastern Washington exhibit a high sulphofying power. From 30–40% of the S, added at rates varying from 50 to 100 pounds per acre, was oxidized during the first 15 days. After longer periods 80–90% of the added S was oxidized. Additions of S to 1000 pounds per acre had little effect upon the H-ion concentration of the soils or upon the rate of oxidation of organic matter added to the soils. The soils studied will absorb comparatively large amounts of oxidized S without any marked retardation of soil biochemical processes.—*F. M. Schertz.*

8368. Newsham, J. C. **The aeration and drainage of soils.** Welsh Jour. Agric. **1**: 147–153. 1925.—Intensive cultivation requires efficient drainage and fully 80% of low crop yields are due to indifferent soil conditions. The chief difficulty nowadays is to secure competent drainers, but reasonable financial assistance is provided by the Ministry of Agriculture through the medium of county agricultural committees. To secure the proper drainage of low lying areas in Great Britian, more particularly near the coast, special authorities (Commissioners of Sewers) are set up, who secure the necessary funds from (1) a rent charge on the owners, (2) an annual level rate upon occupiers, and (3) an extraordinary storm rate upon occupiers. Much can be done to assist drainage by the preservation of natural water-courses. Water-logged land is responsible for some of the most dreaded diseases amongst stock, besides affecting the growth of all cultivated plants.—*Author.*

8369. Niklas, H., und A. Hock. **Zur Frage der Bestimmung der Formen der Bodensäure in Waldböden.** **[Determination of the form of acids in forest soils.]** Forstwiss. Centralbl. **47**: 287–298. *6 fig.* 1925.—Besides determining the actual acidity of soils, as indicated by the pH value, it is desirable to study the total acidity, which can best be done by the electrometric titration method, gradually adding measured quantities of alkaline solution. Curves plotted with pH values as ordinates and amounts of added alkali as abscissas show the total acidity, expressed by amount of alkali required to produce chemical neutrality, or pH 7.07. The shape of the curves, particularly the angle between the curve at approximately pH 5.5 and a line parallel to the absicissa, shows whether the acid is strong (usually free mineral acids, injurious to plants) or weak (usually a more or less innocuous organic acid). By a similar method, using an acid instead of an alkaline solution, the buffer effect of soils, or their resistance to acids, can be investigated.—*W. N. Sparhawk.*

8370. Ramsay, A. A., and A. N. Shepherd. **The use of gypsum for soil improvement.** Agric. Gaz. New South Wales **36**: 259–263. 1925.—The main workable deposits of gypsum in Australia at the present time are limited mainly to Victoria and South Australia, especially the latter province. That found in New South Wales is generally of inferior quality. Plats upon the Yanco irrigation area showed decided improvement in physical character upon the application of gypsum at the rate of ½–1 ton per acre. Soil formerly almost impervious to water penetration shows great improvement after gypsum application and becomes much more loose and friable.—*L. R. Waldron.*

8371. Riedel. **Freiland-Kohlsäuredungung.** **[Carbon dioxide manuring in the field.]** Möllers Deutsch. Gärtnerzeitg. **40**: 153–155. *4 fig.* 1925.—Carbon dioxide manuring in greenhouses has been sufficiently demonstrated as being successful. The first field experiments were conducted near Essen on a small piece of land (144 square yards); on account of the good results the plot was later enlarged to 6½ acres. Pot grown strawberries were better when gassed than when non-gassed. Potatoes from a certain area produced 47,280 pounds from gassed against 11,440 pounds from non-gassed land. Gassed tobacco plants produced strong, upright, deep green leaves, those not gassed were flabby and light green. Also in fruit plantations and tree nurseries CO_2 manuring is recommended. When this gas is given during flowering time and ripening of the fruit, the latter will become larger. Strawberries become sweeter and have better flavor. The application of CO_2 is conducted in the same way as in greenhouses. (See also Bot. Absts. 10, Entry 1459; and 14, Entry 6365.)—*J. C. Th. Uphof.*

8372. Robinson, W. O., and R. S. Holmes. **The chemical composition of soil colloids.** U. S. Dept. Agric. Dept. Bull. 1311. *1–40.* 1924.—The analyses of the colloidal matter (below 1 micron) extracted from 45 representative agricultural soils are given. The colloidal matter was found to consist mainly of silica, alumina, ferric oxide and combined water, with smaller quantities of organic matter, titanium, magnesia, potash, lime, soda, phosphoric acid, manganese, sulphur and chlorin, the proportions varying considerably in different soil colloids. Silica and alumina varied inversely, and when the silica was high the sum of the soluble bases was high and the combined water was low. Colloidal matter from nearby soils showed little variation in composition, but there was considerable variation in the composition of soil colloids from regions of different climates. The climate, through the agency of leaching, is considered the main factor in causing the variation in soil colloid composition, particularly in mature soil colloids. The composition of the parent rock has little influence on the composition of the colloidal matter in mature soils, but is of considerable influence on the composition of recently formed soil colloids. Red or yellow soil colloids show the effect of more profound leaching than gray or black soil colloids, and the red and yellow soil colloids are generally found in the hotter, more humid climates. The present rainfall, however, is not always a reliable indication of the extent to which leaching has taken place.—From attempted physical separations and successive fractionations it is considered improbable that separate particles of different composition exist in soil colloids.—The colloidal matter of soils is made up mostly of the products of chemical weathering. Some finely divided, undecomposed mineral fragments are present and some soil colloids may have a considerable proportion of undecomposed minerals.—Lime, soda, potash, magnesia, and silica were extracted more easily by water from the soil colloids than were iron and alumina, though the colloidal matter held all the constituents with great tenacity. Lime and soda were extracted more easily than potash and magnesia. Digestion with dilute acids removed the red and yellow color of soil colloids. There were indications of 2 forms of iron in soil colloids, one a form of hydrated iron oxide, the other a colorless compound, presumably a silicate. The color of soil colloids is an index to their chemical composition. Red and yellow soil colloids generally have a mols SiO_2: mols Al_2O_3 + mols Fe_2O_3 ratio less than 2. In gray or black soil colloids this ratio is greater than 2.—Stoichiometrical calculations showed that all the silica, alumina, iron and water of hydration were not present in the proportions to form mixtures of the commoner hydrated silicates of alumina and iron such as kaolinite and nontronite. The calculated water of combination and the calculated excesses of free iron oxide checked up fairly well with the combined water found by analysis, and the color of the colloid, respectively. Some, or considerable quantities of the constituents present may be present in compounds of the composition of such minerals as kaolinite, nontronite, halloysite, and pyrophyllite.—*W. O. Robinson.*

8373. Scheffer, F. **Über die art der Umwandlung des Atzkalkes im Boden und ihre Ursachen. [The transformation of caustic lime in soils and its cause.]** Jour. Landw. **72:** 201–235. 1924.—In soils poor in lime the CaO is transformed into $CaCO_3$. A greater part of the CaO is bound in the soil. Only in soils rich in $CaCO_3$ is there probably a quantitative transformation of CaO into $CaCO_3$. The quantitative transformation is hindered by absorbing substances present in the soils. Silicic acid gel and the gel mixture, SiO_2-Al_2O_3, are absorbing substances. SiO_2 gel has the power of decomposing $CaCO_3$.—*F. M. Schertz.*

8374. Starkey, R. L., and J. W. Shive. **Air apparatus used in a study of carbon dioxide evolution from soil supporting plant growth.** New Jersey Agric. Exp. Sta. Ann. Rept. **44:** 241–243. 1923. [1924].—A description is given of the apparatus which has been used with considerable success. It is substantial and compact in structure and so mounted that it is quite easily moved from place to place.—*Wm. H. Martin.*

8375. Stead, H. **Saaidam terraces in the Karroo.** South African Jour. Sci. **21:** 315–321. *Pl. 4–5.* 1924.—An account is given of the so-called saaidam system of terracing leegtes, which appears to have, among others, the following advantages: (1) Perfectly automatic control of flood waters and their use in producing crops where none could otherwise be obtained; (2) storage of water in the soil instead of in a dam, resulting in crops being obtained without failure; (3) the possibility of growing crops in arid regions without need to construct expensive irrigation works.—*E. M. Doidge.*

8376. Süchting, H., A. Römer, und M. Kühne. **Der Abbau der organischen Stickstoffverbindungen des Waldhumus durch biologische Vorgänge. [Withdrawal of organic nitrogen compounds of forest humus through biological processes.]** Forstwiss. Centralbl. **47:** 108–117, 174–188, 264–276. 1925.—Experiments carried on during 1919–1921 are described. Six successive crops (oats, rape, oats, *Lolium perenne*, oats, and mixed grasses) were grown in pots of pine humus, to ascertain the amount of N extracted from the humus by the plants. Various check series were run to study the effects of liming, artificial aeration of the soil, and addition of other mineral salts. It was found that under natural conditions 2.3% of the N present in the humus was made available to plants during the first 2 months, and only 3.25% in 3 seasons combined. Low yields in dry weight of plant tissue were shown to be due to lack of N rather than to any other cause. It is concluded that the bulk of the nitrogen compounds of the pine humus studied are mineralized and made available for plants with great difficulty, probably because of their peculiar molecular structure. These compounds are thought to be heterocyclic phenol derivatives, such as pyridin, chinolin, and acridin.—*W. N. Sparhawk.*

8377. Sutton, Geo. L. **Soil mulching or cultivating experiments.** Jour. Dept. Agric. Western Australia 2nd ser. **1**: 333–334. *5 fig.* 1924.—The following methods of cultivation of fallow were compared at Chapman and Merredin experimental farms: (1) Cultivation in spring, and again during the summer after a fall of rain of 25 points or over until seed time; (2) cultivation in spring and not again until just before seeding in autumn; (3) cultivation in autumn only, just prior to seeding. As an average of 10 years there is a small advantage of (1) over method (2), and a considerable advantage of (2) over (3).—*P. J. Olson.*

8378. Waksman, Selman A., and Robert L. Starkey. **Numbers of microörganisms, nitrifying and carbon-dioxide producing capacity, and soil fertility.** New Jersey Agric. Exp. Sta. Ann. Rept. **44**: 230–231. 1923 [1924].—Results of bacteriological analysis are presented of 3 plots receiving the following treatments: (1) No fertilizer, (2) 2 tons of limestone per acre every 5 years, (3) annual applications of minerals and manure. The crop yields (timothy) of these 3 plots for 1922 were 328, 960 and 5600 pounds; the relative number of microorganisms 100, 151 and 262, the nitrifying capacity 100, 395 and 430 and the CO_2 production in 1 kgm. of soil (14 days incubation), 70.0, 107.1 and 227.4 mgm., respectively.—*Wm. H. Martin.*

8379. Williams, C. O. **Manures and farm foods. Their composition and valuation.** Jour. Dept. Agric. Union of South Africa **9**: 245–260. 1924.—This is a long article containing some valuable hints and information regarding the purchase of manures and feeding-stuffs to the best advantage. The market and agricultural value of fertilizers and farm foods are discussed with special reference to constituents and unit value.—*L. I. Goldblatt.*

8380. Williams, Rice. **The problem of soil acidity in North Wales.** Welsh Jour. Agric **1**: 135–141. 1925.—The typical soils of North Wales are devoid of calcium carbonate. Many of them giving positive results by the conventional lime requirement methods show no response to liming in the field. Such soils are considered in relation to (1) reaction, (2) acidity with neutral salt solutions, and (3) available calcium compounds. (1) The meanings of the terms "total acidity, potential acidity, and buffer action" are discussed. Fertile Welsh soils are highly buffered and have a pH varying from 5.6 to 6.8.—(2) The lime requirements of a number of these soils as shown by methods depending on the liberation of acid by treating with neutral salt solutions are small when compared with those obtained by other conventional methods such as the Hutchinson and McLennan method. The Comber thiocyanate (qualitative) test is useful. Positive results suggest that a further examination is necessary. Negative results show that the soil contains sufficient lime.—(3) In the absence of calcium carbonate, the exchangeable calcium (Hissink method) is of considerable importance in determining the need for lime. A soil may posses a considerable amount of exchangeable calcium and yet be unsaturated and capable of decomposing large amounts of calcium carbonate. A moderate degree of unsaturation appears to be not entirely inconsistent with fertility. On the other hand, where responses have been obtained for liming, a high degree of unsaturation is shown.—*Author.*

8381. Wood, T. B. **The chemistry of crop production.** *2nd ed. 193 p.* University Tutorial Press, Ltd.: London, 1924.—Methods of mechanical analysis of soils are discussed in connection with their relationship to soil type and productivity. Descriptions of numerous soil properties and directions for experimental study of certain physical properties, are given. The chemical constituents found in soil are given together with the plant requirements of these constituents. Emphasis is placed upon methods for testing the availability of the various plant food elements and for the testing of acidity. General principles of manuring and the application of commercial fertilizers form an important part of the work.—*M. S. Anderson.*

BIBLIOGRAPHY, BIOGRAPHY AND HISTORY

Carroll W. Dodge, *Editor*

Charles A. Weatherby, *Assistant Editor*

(See also in this issue Entries 8361, 8694, 8909, 8930, 8952, 9019, 9258, 9292, 9343, 9612)

8382. Anonymous. **Alfred Clarke (1848–1925), a Huddersfield botanist.** Naturalist **1925**: 29–31. *Portrait.* 1925.

8383. Anonymous. **Emil Herrmann.** Zeitschr. Pilzkunde **4**: 58–59. *Portrait.* 1925.—Herrmann (1861–1925) was a teacher in the Dresden schools and the author of numerous articles and books on mushrooms.—*C. A. Weatherby.*

8384. Anonymous. **Herbals.** Missouri Bot. Gard. Bull. **10**: 68–73. 1922.—Sixteen rare pre-Linnaean publications in the library of the Missouri Bot. Gard. are briefly described.—*O. T. Wilson.*

8385. Anonymous. **James Alfred Wheldon, M.Sc., A.L.S. (1862–1925) of Liverpool.** Naturalist **1925**: 29–31. *Portrait.* 1925.

8386. Anonymous. **Lue Gim Gong.** Florida Grower **31**^{24}: 9. 1925.—Lue Gim Gong came from China when 12 years old and died in DeLand, Florida, June, 1925. In 1886 he went from Massachusetts to DeLand. He was actively engaged in plant breeding and originated a tomato bearing large clusters of uniform sized fruit, also a salmon colored raspberry. The Lue Gim Gong orange (Hart's Late × Mediterranean Sweet) is of much importance as a late variety in Florida. The Gim Gong grape fruit endures several degrees more cold than other varieties. The U. S. Department of Agriculture awarded him the Wilder Medal. His father was a Chinese farmer and while still a little lad he was taught the art of pollination.—*J. C. Th. Uphof.*

8387. Anonymous. **Professor Forstmeister Wiebecke, Eberswalde.** Deutsch. Forstzeitg. **40**: 280. 1925.—Ernst Wiebecke was born in Frankfurt-on-Oder, Feb. 4, 1863. Educated at Berlin and Eberswalde, in 1889 he was appointed city forester for Frankfurt; in 1898 he entered the State Forest Service, and in 1908 was put in charge of the school forest at Eberswalde. In 1922 he was made a full professor at the Forest Academy. He is widely known for his accomplishments in improving the status of private forestry and in developing training courses for forest owners and their employees.—*W. N. Sparhawk.*

8388. Anonymous. **The Chelsea physic garden.** Missouri Bot. Gard. Bull. **10**: 55–67. *Pl. 8.* 1922.—A historical sketch of the Chelsea garden is given, followed by a tabulated list of the plants to be grown in a replica of the garden at the Missouri Botanical Garden, 176 species are listed.—*O. T. Wilson.*

8389. Anonymous. **Zu Eugen Grambergs 60. Geburtstag. [The sixtieth birthday of Eugen Bramberg.]** Zeitschr. Pilzkunde **1**: 1–2. 1925.—A brief sketch is given of the life and works of Eugen Gramberg, one of the leading German students of fungi.—*Frederick V. Rand.*

8390. Chardon, Carlos E. **Augustín Stahl.** Rev. Agric. Puerto Rico **12**: 68–84. *3 fig.* 1924.—This is an account of the life and work of Augustin Stahl, the Porto Rican botanist and naturalist.—*John A. Stevenson.*

8391. Coll y Toste, Cayetano. **Historia del desarrollo de la agricultura y de la propriedad territorial en Puerto Rico. [History of the development of agriculture and territorial property rights in Porto Rico.]** Rev. Agric. Puerto Rico **10**: ^{2}6–15, ^{3}5–13, ^{4}5–12, ^{5}5–9, ^{6}5–14. **11**: ^{1}9–13, ^{2}7–11, ^{3}7–12, ^{4}7–11. 1923.—This is a detailed history from original sources of the development of the leading agricultural industries of Porto Rico from the date of the discovery of the island.—*John A. Stevenson.*

8392. De Toni, G. B. **Alberto Grunow.** Ann. Naturhist. Mus. Wien **38**: 1–6. 1925.—There is given in Italian a biographical sketch of Albert Grunow, a student of algae, especially of diatoms and desmids. Grunow was born in 1826 and died in 1914.—*A. S. Hitchcock.*

8393. E., J. **Zwanzig Jahre Danziger Technische Hochschule. [Twenty years of the Danzig Technical College.]** Minerva-Zeitschr. **1**: 109–110. 1925.

8394. Graves, H. S., Filibert Roth, and R. Y. Stuart. **Dr. Joseph Trimble Rothrock.** Jour. Forest. 20: 567–568. 1922.—This is a resolution adopted by the Society of American Foresters after the death, on June 2, 1922, of Dr. Rothrock, surgeon, botanist, and leader in forestry, especially in Pennsylvania.—*Philip C. Wakeley.*

8395. Harper, Roland M. **Development of agriculture in upper Georgia from 1850 to 1880.** Georgia Hist. Quart. 6^1: 3–27. *Map.* 1922.—In upper Georgia the following divisions are considered: (1) In the northwest corner, the Cumberland Plateau, a comparatively level region with horizontal strata of sandstone and rather sandy soils; (2) the Appalachian Valley, with an area of about 3000 square miles, characterized by a great variety of geological formations and in climate near the northern limit of cotton; (3) the Blue Ridge, an area of about 2000 square miles in which the rocks are mostly sandstone, gneiss and mica shist and the soils not particularly fertile except in the bottoms of the valleys, and (4) the Piedmont Region, covering about 20,000 square miles, and characterized by granite, gneiss, and other crystalline rocks which weather into clay, clay loam and sandy loam of medium fertility, and by hilly to broken topography.—After taking up the sources of historical information upon which the paper is based, the author then proceeds to discuss through text and stratistical tables the different types of the agricultural population, the crops, farm implements, methods of cultivation and fertilization, domestic animals, sizes of farms, etc., for the period under discussion.—(For abstract of author's paper on lower Georgia see Bot. Absts. 14, Entry 6932.)—*Frederick V. Rand.*

8396. Hauman, Lucien, y Alberto Castellanos. **Bibliografía botánica argentina: Especialmente para los años 1914–1921. [Bibliography of Argentine botany, 1914–1921.]** (Primer suplemento a la obra bibliográfica de F. Kurtz.) Physis (Rev. Soc. Argentina Cien. Nat.) 5: 263–291. 1922.

8397. Ledder, K. **Karl Hanabarger.** Oesterreich. Vierteljahresschr. Forstw. 42: 37–38. 1924.—This is a brief biography of the forester, Hanabarger, who was in charge of the Rothschild Forests in Austria from 1906.—*K. W. Woodward.*

8398. Linck, Olaf. **Hos Opdyrkerne paa den jydske Hede. [With the settlers of the Jutland heather.]** Tidsskr. Landókonomi 3: 105–136. 1925.—This is a discussion of present day conditions on the large tract of reclaimed land in the heather district of Jutland, in contrast with the pioneer conditions of 60 years ago which were similar in many respects to the early days of the American West. The area of what was formerly waste land comprises almost $\frac{1}{6}$ of Jutland; today over $\frac{2}{3}$ of the heather area is covered with fertile farms or excellent woodland. During the early days of reclamation, the settlers suffered severe hardships.—*Albert A. Hansen.*

8399. Marchal, Em. **Guillaume Gillekens, 1858–1921.** Ann. Gembloux 27: 153–155. 1922.—This is a brief account of the career of Guillaume Gillekens, professor of rural engineering at the Institut Agronomique de Gembloux.—*E. Marchal* (*translated*).

8400. Marchal, Em. **Jean Chalon. Notice biographique.** Bull. Soc. Roy. Bot. Belgique 55: 7–17. 1922.—Jean Chalon, Belgian botanist and man of letters, left an important work, the main object of which is to popularize scientific knowledge. He produced several original works of note, especially on anatomy in its bearing on classification and on marine algae.—*Author* (*translated*).

8401. Moore, George T. **Thirty-sixth annual report of the Director.** Missouri Bot. Gard. Bull. 13: 1–23. *Pl. 1–3.* 1925.

8402. Setchell, W. A. **Frank Shipley Collins 1848–1920.** Amer. Jour. Bot. 12: 54–62. *1 pl.* 1925.—Collins, although an amateur, made notable contributions to the science of phycology. A bibliography of his papers is appended.—*E. W. Sinnott.*

8403. U. S. A. Experiment Stations, Office of. **List of bulletins of the Agricultural Experiment Stations in the United States from their establishment to the end of 1920.** U. S. Dept. Agric. Dept. Bull. 1199. *1–185 p.;* Supplement 1, listing bulletins of the Agric. Exp. Stations for 1921–1922. *1–24 p.* 1924.

8404. Urban, I. **Apuntes historicos de las investigaciones botanicas de la isla. [History of botanical investigation in the Island.]** Rev. Agric. Puerto Rico. 12: 97–107. 1924.—This is a history of botanical investigations in Puerto Rico previous to 1906, translated and adapted from Urban's Symbolae Antillanae, vol. IV (Flora portoricensis), 1911.—*John A. Stevenson.*

8405. Vines, S. H. **Reminiscences of German botanical laboratories in the 'seventies and 'eighties of the last century. I.** New Phytol. 24: 1–8. 1925.—The author records his experiences as a student in the laboratory of Sachs in Würzburg in 1877 and 1880 and of deBary in Strassburg in 1879 and 1880.—*I. F. Lewis.*

BOTANICAL EDUCATION

C. Stuart Gager, *Editor*

Arthur H. Graves, *Assistant Editor*

(See also in this issue Entries 8268, 8518, 8643, 8662, 8855, 8909, 9040, 9287, 9292, 9656)

8406. Anonymous. **School for gardening.** Missouri Bot. Gard. Bull. **10**: 95–101. 1922.

8407. Anonymous. **The proscription of Darwinism.** Nature **115**: 485–486. 1925.—This is an editorial comment upon legislation and controversy in the U. S. A.—*O. A. Stevens.*

8408. Anonymous. [Rev. of: Poulton, Ethel M. **The teaching of biology in schools and training colleges.** *xv + 142 p.* Cornish Bros.: Birmingham, 1924.] Nature **115**: 415. 1925.

8409. Anonymous. **Science for the public.** [Rev. of: (1) Slosson, Edwin E. **Chats on Science.** *vii + 253 p.* G. Bell & Sons: London, 1924. (2) Slosson, Edwin E. (Editor). **Keeping up with science; notes on recent progress in the various sciences for unscientific readers.** *xv + 355 p. 30 pl.* Jonathan Cope: London, 1924.] Nature **115**: 561–562. 1925.

8410. Benedict, R. C. **The conservation of beauty.** Brooklyn Bot. Gard. Leaflets **13**$^{5-6}$: 1–8. 1925.—This leaflet is a reprint, revised and enlarged, of Series 12, No. 2, 1924. (See Bot. Absts. 13, Entry 4844.) In addition to some new matter regarding practical means for furthering the conservation of our native plants, there is appended a copy of the amendment to the New York State Conservation Law, enacted April 1, 1925, for the protection of trailing arbutus (*Epigaea repens*).—*A. H. Graves.*

8411. Chen, Chunjen C. **Agricultural education in North China.** The China Weekly Rev. [Millard Publishing Co.: Shanghai,] **32**: 135–138. *Pl. 9.* 1925.—A survey of 7 agricultural institutions in North China as to their organization, equipments, program of work, and efficiency in carrying out the work. The institutions studied are: National College of Agriculture, Peking; Peking University, Peking: Tsing Hua University, Peking; Hsiang Shan Children's Home, near Peking; Agricultural Department of Hui Wen Middle School, Changli; Central Governmental Agricultural Experiment Station, Peking; and Tsingtao Agricultural Experiment Station, Li Tsun, Tsingtao.—*Chunjen C. Chen.*

8412. De Wildeman, E. **L'Enseignement universitaire et la Colonie. [University instruction and the colony.]** Ann. Soc. Sci. Bruxelles 42^{1}: 286–293. (Documents et Comptes rendus). 1923.—The need of university instruction in colonial affairs is urged, both to train men for colonial administrative work and to bring about among the Belgian public a better acquaintance with the Belgian Congo. This can be done by special courses or by additions to the related courses already in existence, in which the Congo may be studied in regard to its needs, its customs and local institutions, the country and its inhabitants, the flora, the fauna, the geology and mineralogy.—*A. H. Graves.*

8413. Hobson, E. W. **The domain of natural science: The Guilford lectures delivered in the University of Aberdeen in 1921 and 1922.** *xvi + 510 p.* University Press: Cambridge, 1923.— ". . . . the question as to the exact position which what is often termed the scientific view of the world should rightly occupy, in relation to the other factors of human experience with which Religion and Philosophy are concerned, is one which gives rise to very divergent opinions amongst earnest thinkers. . . . My main object in preparing the lectures which are here published was to provide a reasoned contribution towards the clarification of ideas in relation to this fundamentally important question."—The subject matter is discussed under the following chapter headings: Introduction, scientific laws and theories, natural science in relation to philosophy, causation and deterministic systems, number and its developments, time and space, corpuscular theories of matter, dynamics, the conservation of matter and energy, mechanical theories and thermodynamics; electricity, magnetism, and light; the constitution of matter, cosmical theories, Einstein's theory of relativity, biological science, the living organism, heredity, the evolution of species, natural science and general thought, and natural science and theism.—*Frederick V. Rand.*

8414. Palestine, American Colony. **The plants of the Bible.** *2nd ed. 1–61 p.* Fr. Vester & Co.: Jerusalem, [No date].—"This booklet is prepared to accompany the Bible Herbarium and also the Bible Cabinet, and further to give a simple brief account of the plants of the Bible, not entering into discussion of disputed points, but setting forth the most probable identifications in the light of many years' residence in Jerusalem."—The arrangement is alphabetical according to common names.—*Frederick V. Rand.*

8415. Praesent, Hans. **Die deutsche wissenschaftliche Vermittlungsstelle in Barcelona. [The German scientific exchange in Barcelona.]** Minerva-Zeitschr. **1**: 93–95. 1925.

8416. Scott, D. H. **Reminiscences of German botanical laboratories in the seventies and eighties of the last century. II. German reminiscences of the early eighties.** New Phytol. **24**: 9–16. 1925.—The author records his experiences as a student in the laboratory of Sachs in Würzburg in 1880–1882.—*I. F. Lewis.*

8417. Shaw, Ellen Eddy. **Twelfth annual garden exhibit for Brooklyn boys and girls.** Brooklyn Bot. Gard. Leaflets 13^4: 1–4. 1925.—This leaflet sets forth the details for entry to the exhibition of flowers and vegetables held in September. It is announced that this is to be the last exhibit, since its object, namely to establish among the boys and girls in the Borough of Brooklyn a more enthusiastic interest in gardening, has now been attained.—*A. H. Graves.*

8418. T[ansley], A. G. **General botany and the biology of plants.** [Rev. of: (1) Transeau, E. N. **General botany, an introductory text for colleges and advanced classes in secondary schools.** *x + 560 p. 351 fig.* New World Sci. Ser., World Book Co.: Yonkers-on-Hudson, New York. 1923 (see Bot. Absts. 13, Entry 2322). (2) Transeau, E. N., and H. C. Sampson. **Laboratory and field work in general botany.** *vi + 154 p.* Ibid, 1924 (see Bot. Absts. 13, Entry 4131). (3) Skene, Macgregor. **The biology of flowering plants.** *xi + 523 p. 8 pl., 68 fig.* Sidgwick & Jackson, Ltd.: London, 1924 (see Bot. Absts. 14, Entry 1171). (4) Clements, F. E., and Frances L. Long. **Experimental pollination: an outline of the ecology of flowers and insects.** Carnegie Institution Washington Publ. 336. *vii + 274 p. 17 pl.* 1923 (see Bot. Absts. 14, Entry 1224).] New Phytol. **23**: 293–296. 1924.

8419. Thomas, Stanley. **Bacteriology: A text book on fundamentals.** *xiii + 201 p. Portrait, 12 fig.* McGraw-Hill Book Co.: New York, 1925.—"While medical bacteriology has been of invaluable service to mankind . . . . the fact must not be lost sight of that medical bacteriology is simply one branch of a science which is, like its parent sciences chemistry and biology, of educational and practical value to mankind in many and varied fields of endeavor. . . . . In teaching elementary Bacteriology to mixed classes . . . . the author has come to a keen realization of the need of a text which treats of the fundamentals of this science—fundamentals upon which the chemist, who later is employed in a fermentation plant, the medical student, and the sanitary engineer can build a superstructure of his own specialized knowledge. In an attempt to satisfy this need, this volume was written."—An introductory chapter takes up the general conception of life and its processes. Following this, the body of the text discusses in turn the history of bacteriology, classification (following Bergey's "Determinative bacteriology"), morphology and physiology of bacteria, bacterial enzymes, microorganisms other than bacteria, bacteriology of water, of sewage, of the air, of soils, of foods, pathogenic bacteria (largely of man and animals), immunity, hygiene and sanitation, and bacteria in the industries.—"In reading the various chapters . . . . the experienced teacher will realize that only the barest outline is presented. In teaching certain groups of students, this will be sufficient; for others, this outline will serve as a basis for study which . . . . can readily be elaborated upon by lectures."—*Frederick V. Rand.*

8420. Trelease, William. **Winter botany; a companion volume to the author's Plant materials of decorative gardening.** *2nd ed. xlii + 396 p. Illus.* The author: Urbana, 1925.

8421. Wolff. **Das landwirtschaftliche Versuchswesen in Kamerun mit besonderer Berucksichtigung des Baumwollenbaues. [Agricultural research in Cameroons, especially in relation to cotton growing.]** Tropenpflanzer **26**: 38–49. 1923.—Agriculturally, Cameroons is divided into the coastal land, high elevated land of 1000 m. above sea-level, and the Central

African plateau. The agricultural experiment stations in Victoria, Kuti and Pittoa, the school for natives, and other institutions are described. Meteorological data were carefully recorded as being considered of much value for estimating the proper time for sowing and harvesting the various crops. Outlines of experiments with cotton, rubber (Kickxia and Hevea) and the oil palm, *Elaeis guineensis*, are given.—*J. C. Th. Uphof.*

8422. Zimmermann, A. **Rückblick auf die Tätigkeit des Biologisch-Landwirtschaftlichen Institut Amani. [Work of the Biological-Agricultural Institute Amani.]** Tropenpflanzer **27**: 107–110. 1924.—A description is given of the work, collections, laboratories, library and plantations of the Biological-Agricultural Institute Amani, formerly in German-East Africa.—*J. C. Th. Uphof.*

CYTOLOGY

Gilbert M. Smith, *Editor**

(See also in this issue Entries 8717, 8722, 8726, 8744, 8759, 8767, 8773, 8785, 8951, 8956, 8964, 8969, 9062, 9164, 9171, 9225, 9289)

8423. Balls, W. L. **The determiners of cellulose structure as seen in the cell-wall of cotton hairs.** Proc. Roy. Soc. London B **95**: 72–89. *Pl. 5–6, fig. 1–5.* 1923.—Examination of the primary wall of the cotton hair shows it to contain 2 opposite spirals. In secondary thickening only one of these spirals is followed at a time, but there is a reversal of direction, namely, a change in the primary spiral followed at frequent intervals along the hair. The number of these reversals is not constant nor is their position regular, but they correspond roughly to the number of days required for growth in length of the hair and so are thought to be determined in the primary wall during growth in length and before secondary thickening begins. In addition to the foregoing, called quick or pit spirals (29°), another type called slow or slip spirals (70°) can be demonstrated in mature cotton hairs which have been subjected to severe stress. The 2 types are believed to be related and their direction is opposite. The points of reversal determine the convolutions shown in the ripened hair and the change of the hair from living cylindrical to dead convoluted form seemed an irreversible, structural dehydration change rather than a physical effect due to mere drying. Elliptically polarized light was found to be of great assistance in demonstrating these facts. Certain conjectures are made concerning the space-lattice structure of cellulose but the belief is expressed that final conclusions must be based on X-ray work.—*P. B. Sears.*

8424. Campin, M. G. **A cytological study of pollen development in Nolana.** New Phytol. **24**: 17–23. *Pl. 1–2.* 1925.—The haploid chromosome number in *Nolana atriplicifolia* and *N. prostrata* is 12. The identity of the chromosomes is maintained from the prochromosomes of the mother-cell nucleus to the end of the homotypic division. Nucleolar budding is seen in the mother-cell nucleus. The method of conjugation is by telosyndesis. Pollen grain formation takes place by furrowing. Cytomixis is of normal occurrence during meiosis. The history of the tapetal cells is outlined.—*I. F. Lewis.*

8425. Campin, M. G. **An irregular method of pollen formation in Solandra grandiflora Sw.** New Phytol. **23**: 282–287. *Fig. 1–19.* 1924.—Persistent irregularities are described in the distribution of the 11 (possibly 12) chromosomes of *Solandra grandiflora* Sw. In the heterotypic division chromosomes may be extruded into the cytoplasm and perish, or they may persist and form pollen grains. The nuclei at the poles of the heterotypic mitosis frequently show a quantitative difference in chromosome number. This leads to the production of 2 pairs of pollen grains, one small and one large, from a mother cell. Binucleate grains, resulting from the failure of the 2nd cell cleavage, are common. It is proposed to use the term "erratic chromosome" for any chromosome which escapes or is thrust out from the sphere of action of the spindle. The irregularities in meiosis are not due to environmental conditions or to any hybridity in the history of the species.—*I. F. Lewis.*

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* Due to temporary absence of the Editor, responsibility for the section this issue rests in part with the Associate Editor-in-Chief.

8426. Chipman, Ruth Hayes. **A study of synizesis and synapsis in Lilium superbum L.** Amer. Jour. Bot. 12: 1–18. *4 pl.* 1925.—Alveolation of the chromosomes of the last archesporial mitosis begins in the telophases. The alveoli, at first axial, are later placed so that the chromosomes become resolved into irregular reticula. In early prophase of the heterotypic mitosis pollen mother cells show a delimination of unit reticula, which become resolved into zigzag threads. Condensation throws portions of these threads into tangled coils. Pairing of the threads if parasynaptic and usually takes place before synizesis. The associated parasynaptic threads remain independent in all stages. The thread system emerges from synizesis as a double pachynema of parasynapsis and this doubleness persists to the heterotypic metaphase. The first breaks in the segmentation occur at the periphery and the segments are long, extending across the nucleus. Free ends appear in pairs. Cross division of the double pachynema results in 12 segments, each of which develops into a pair of metaphase chromosomes. A segment of the double pachynema may be cut out at the periphery, and the pair of chromosome initials thus formed does not become entangled in the 2nd contraction figure. A lengthwise split develops in each of the associated chromosomes, but the exact time of its appearance has not yet been determined. It should be noted that the early pairing of the threads presents abundant opportunities for the breaking and recombination of threads, which is the cytological interpretation of the crossing-over of genetic factors.—*E. W. Sinnott.*

8427. [Delone, L. N.] Делонс, Л. Н. **Сравнительно-кариологическое Исследование Видов Muscari Mill. и Bellevallia Lapeyr. [Comparative caryologic observation of forms of Muscari Mill and Bellevalia Lapeyr.]** Вестник Тифлисского Ботанического Сада. Новая Серия. [Monitor Tiflis Bot. Gard. n. s.] **1:** 24–25. *Pl. 1.* 1922–1923.—The author points out that the study of the nuclear plates enables one to solve purely systematic problems, and he suggests the term "Karyotypus" for the designation of the systematic characteristic which caryologically similar types of a species possess.—*L. J. Pessin.*

8428. Krjatchenko, Douze. **De l'activité des chondriosomes pendant le développement des grains de pollen et des cellules nourricères du pollen dans Lilium croceum Chaix. [The activity of the chondriosomes during the development of the pollen-grains and the tapetal cells in Lilium croceum Chaix.]** Rev. Gén. Bot. 37: 193–211. 1925.—In the primordial pollen-mother cells which are still in a period of intense multiplication, a fragmentation of the chondriocontes into mitochondria and an intermediate stage of chondriomites occurs. In the stage of prophase of the 1st division of the pollen mother cells one portion of the chondriosomes begins to accumulate a certain "greasy substance;" another portion remains in the form of very small mitochondria, but still visible with the microscope. This subdivision of chondriosomes has already commenced to disappear at the stage of synapsis.—In the stage of the tetrads one portion of the mitrochondria are amassed at the periphery of the cell. These mitochondria manifest here a great intensity of growth, passing to the exterior surface of the cell and becoming transformed little by little into a system of pitted embossings on the envelope of the pollen grains.—During all the stages described, no starch is to be found in the interior of the pollen grains; it is only in the stage of the large vacuole that the starch grains begin to appear. In the interior of the tapetal cells, there are formed certain drops which will reduce osmium which passes from these cells into the cavity of the pollen sac; in all probability these drops have the same composition as the "greasy substance" of the pollen grains. The secretion in the tapetal cells begins at the time of the 2nd division in the stage of the diads or the tetrads and following the beginning of the process of excretion described above.—The formation of the "greasy substance" in the tapetal cells occurs also with the immediate clumping of the chondriosomes which are divided also in this stage into 2 groups as in the pollen in other cells.—The chondriosomes which secret in their interior the "greasy substance" have the aspect of long filaments, for the most part irregularly swollen at the ends; these filaments enlarge little by little and take the form of elongated sacs which later are transformed into rounded balls. In the tapetal cells no starch is found.—*J. C. Gilman.*

8429. Lubliner, K. **Ueber die Plastiden in der Eizelle von Podophyllum peltatum. [The plastids in the egg-cell of Podophyllum peltatum.]** Acta Soc. Bot. Poloniae 2: 225–227. *1 pl.* 1924–1925.—Preliminary report. The question will be discussed in full in a paper by the same author soon to appear.—*H. Czeczott.*

8430. Luxemburg, A. **Zur Frage der Anwesenheit von Plastiden in den generativen Zellen.** [The presence of the plastids in the generative cells.] Acta Soc. Bot. Poloniae **2**: 228–231. *Fig. 1.* 1924–1925.—The author has found the plastids in the generative cells of the genera *Cephalotaxus* and *Torreya.—H. Czeczott.*

8431. Sharp, Lester W. **Recent advances in cytology.** Amer. Jour. Bot. **11**: 610–616. 1924.—The author emphasizes the importance of the conception of protoplasm as a colloidal system; discusses the character of plastids and other cytoplasmic inclusions; notes that although the parallelism between the behavior of chromosomes and genetic factors is complete, there is yet no convincting cytological evidence for certain features of the structure and behavior of chromosomes which have been postulated by geneticists, and mentions the modern tendency to regard the whole organism rather than the cell as the primary agent of organization. The alliances which cytology has established with other branches of biology and with the other sciences is particularly encouraging.—*E. W. Sinnott.*

8432. Strangeways, T. S. P., and H. E. H. Oakley. **The immediate changes observed in tissue cells after exposure to soft x-rays while growing in vitro.** Proc. Roy. Soc. London B **95**: 373–381. *Pl. 20–21.* 1923.—Cells from chick choroid exposed to soft x-rays at a temperature of 39°C., after a latent period of 15–20 minutes, showed a gradual decrease in mitotic activity. The first indication was fewer cells in prophase, followed by disturbance in the later phases, lagging and granulation of chromosomes, and finally cell disintegration. Resting cells were apparently slow in being disturbed. Some cells showed hypertrophy. No changes were noticed which were essentially different from those found in cells growing in unfavorable media.—*P. B. Sears.*

8433. Taylor, Wm. Randolph. **The chromosome morphology of Velthemia, Allium and Cyrtanthus.** Amer. Jour. Bot. **12**: 104–115. *35 fig.* 1925.—Material from root-tips and from microsporogenesis was studied. The specific identity of many chromosomes in these genera was established. In *Velthemia viridifolia* Jacq. there are 20 pairs of chromosomes, 8 of which are large and have recognizable differences, chiefly in the relative sizes of the arms. In *Allium cepa* L. one pair of chromosomes is clearly distinguishable from the rest, chiefly by a difference in fiber attachment. In *Cyrtanthus parviflorus* Baker there are 6 types recognizable among the 8 pairs.—*E. W. Sinnott.*

8434. Tsinen, Sou Jou. **Recherches histologiques et cytologiques sur la panachure dans le genre Abutilon. [Histological and cytological researches on variegation in the genus Abutilon.]** Bull. Soc. Sci. Nancy Ser. IV 2^1: 25–26. 1923.—Two principal variegations are known, one consisting of blotches or stripes of yellow, the other of white. The yellow is transmissible by the graft, the white is not. Appearing to be essentially different, studies were undertaken on these 2 forms. *Abutilon Thompsoni* offers an example of yellow variegation. A short cut longitudinally permits the study of the histology of a young leaf. The different cells contain the granular elements and the wavy filaments which we designate, respectively, chondriconts and mitochondria. As shown by Schimper, Guilliermond, and his students, and in this study, such elements are present from the origin of the plastids. As the granular mitochondria enlarge, the chondrioconts enlarge also and split, transforming themselves into plastids. This modification affects the chondrioconts of all parts of the leaf as well as the central parts which are to become the palisade tissue and the lacuna tissue of the superficial layer which is to form the epidermis. The same histologic and cytologic evolution reaches the different parts of the same leaf, those which are later to form the yellow regions as well as those which are to form the green parts; the same histologic and cytologic structure is found throughout the adult leaf, both yellow and green parts containing the plastids and differing only in the color of the plastids.—Studies on the white variegation in *Abutilon Sawitzii*, on the contrary, showed that the green and the colorless regions of the leaves differ profoundly in histologic and cytologic characters. The evolution of the regions in the young leaves which are to form the green parts is exactly like that in the preceding studies. But in the regions which are to form the colorless areas, neither palisade nor lacuna tissue is formed; the leaf remains thin and its cells are not differentiated. The chondrioconts remain mostly in the state of chondrioconts, along with the unmodified granulose mitochondria. Only some chondrioconts, especially in the epidermis, are transformed into plastids which become slightly greenish.—Thus, while the yellow variegation accords with the general anatomic structure of the leaf of *A. Thompsoni*, influencing only the nature of the pigments, the white variegation involves, in *A. Sawitzii*, more important modifications; the histologic structure is changed, the tissues remain undifferentiated and their feeble development is explained by the thinness of the leaf; the evolution of the elements is profoundly altered; the chondrioconts are not transformed in general into plastids.—*A. Chase.*

8435. Woycicki, Z. **Certain detail de la couronne equatorial chez Yucca recurva Salisb. [Some details of the equatorial plate of Yucca recurva Salisb.]** Acta Soc. Bot. Poloniae **2**: 232–238. *Fig. 6.* 1924–1925.

8436. Zimmermann, Walter. **Zytologische Untersuchungen an Sphacelaria fusca Ag. Ein Beitrag zur Entwicklungsphysiologie der Zelle. [Cytological studies on Sphacelaria fusca Ag. A contribution to the developmental physiology of the cell.]** Zeitschr. Bot. **15**: 114–175. *7 fig.* 1923.—The centriole radiations were especially investigated in this marine phaeophyceous alga. Observation of the extraordinarily clear living cell showed that the optical image of radiation is produced by the convergence of the plasma membrane on the radiation center (centriole). It constitutes a flattened alveolar system, as opposed to the concept of a system of linear rays that has been held up to this time. This conclusion has been reached through the different reactions of the vacuoles towards vital staining with neutral red. Observations of living material also show a lack of the fibrous structure. The author holds that the fibers appearing in fixed material are artefacts. In the course of cell division there is a doubling of the radiations through a division of the ray centrum and a migration of the 2 centers to opposite poles of the cell. In the metaphase the nucleus contracts along its long axis and the radiation orientation disappears, the plasma vacuole walls arranging themselves in hexagonal alveoli. The appearance of a Brownian movement at this time is taken as evidence of the lessening of the viscosity.—During the reconstruction phases of the apical cell the ray centrum is an indicator of the morphological polarity of the cell. The physiological polarity is evidenced by the direction of growth of the cell. The physiological polarity is independent of the morphological polarity. The author holds that orientation of the plasma walls of radiation is brought about by local increase in the viscosity of the plasma. Cytological and physiological observations are given on nuclear and cell division; structure, form, and origin of the membrane; restitution experiments and their relation to the wound hormone theory; experimental studies on hair formation; and, in addition, ecological observations on the alga.—The author holds that there is a fundamental analogy between conditions in *Sphacelaria* and the radiation systems of other organisms (polar rays, nuclear spindles, etc.). The results obtained by American investigators using the microdissection method agree with those of the author as one compares the watery rays with the cell sap vacuoles and the highly viscous "surrounding granular cytoplasm" with the plasma walls of radiation.—*From author's abstract (translated).*

ECOLOGY

Geo. D. Fuller, *Editor*

(See also in this issue Entries 8300, 8521, 8525, 8533, 8543, 8559, 8560, 8565, 8566, 8567, 8569, 8570, 8571, 8581, 8584, 8589, 8590, 8595, 8629, 8630, 8633, 8653, 8657, 8671, 8672, 8689, 8706, 8783, 8847, 8890, 8934, 8948, 8957, 8971, 8979, 8982, 8984, 8986, 8987, 8989, 8991, 8995, 9057, 9059, 9079, 9116, 9146, 9280, 9366, 9517, 9531, 9580, 9581, 9595, 9612, 9652, 9653, 9660, 9662)

GENERAL, FACTORS, MEASUREMENTS

8437. Arrhenius, O. **Hydrogen ion concentration, soil properties and growth of higher plants.** (In English.) Arkiv. Botanik **18**: 1–54. 1922–1924 [1922].—The author refers to the large amount of work on this subject carried out during recent years by many scientists and from varied points of view. He expresses the need of working over all this data showing the intimate relations existing between the reactions and all factors in the habitat, how the cell reaction of plants is influenced by the H-ion concentration of the substrate and vice versa, and the means at hand for changing the soil reaction.—In the 6 sections of the paper the author then proceeds to give a critical review of the situation as regards methods (soil investigations, extraction, treatment, influence of storing, etc., carbon dioxide error, titration curves and cell sap investigations); the actual acidity of the soil (the soil as an ampholyte, influence of origin and composition, of climate, of vegetation, and of human action, the solubility of different nutrients and of poisonous substances, and the physical properties of the soil); pH in relation to biological soil factors; relation of higher plants to the reaction (lime and lime requirement, natural associations, estimation of soil acidity by investigation of the flora, germination and growth rate, growth, influence of pH on nutrition and absorption, competition); the reaction of the cell sap and the influence of external conditions and the change of the soil reaction (titration curves, root excretions, humus formation, selective absorption, fertilizing, liming, green manure, acidification, strong salt action).—A bibliography of 250 titles is appended.—*Frederick V. Rand.*

8438. Arrhenius, O. **Kort översikt av markreaktionens betydelse för väksternas liv. [Synopsis of the importance of soil reaction for plant life.]** (Abstract.) Nordisk Jordbrugsforskning 1922: 380–386. 1922.—(See preceding entry.)

8439. Bews, J. W. **Notes on the evolution of plant growth forms.** South African Jour. Sci. 20: 290–303. 1923.—Comparatively little attention has been given to the bearing of ecology on evolution (ecological evolution); nevertheless, it is accepted that plants are adapted to their environment, and changes in the environment throughout geological time have influenced and guided the course of evolution.—At the time of the rise of the angiosperms in the Lower Cretaceous, geological evidence points to the fact that the climate of most of the world was uniformly warm and moist. There have been many great cyclic changes since then, but certain habitats—(1) seashore; (2) aquatic, marsh, or streambank; (3) tropical and subtropical forest, and (4) possibly also mountain habitats—have remained always relatively constant and unchanged. It may reasonably be supposed that primitive types will be found in such unchanging habitats. An examination of all the families usually considered primitive by the systematists, show that, on the whole, this is the case.—It is pointed out that grassland areas, dry scrub and desert areas were derivative and developed in response to increasing aridity. The origin of the Gramineae is considered to be almost the most important problem in connection with the evolution of growth forms, and it is suggested that they most likely arose from helophytic (marsh) ancestors rather than from forest types. With the establishment of great areas of grassland the multiplication of the geophytic type became possible. Phanerophytes, hydrophytes and helophytes are more ancient than geophytes, hemicryptophytes and therophytes.—Mesophytes and hydrophytes are more ancient than xerophytes. Various types of xerophytism, for example, succulence and spinescence, are almost certainly derivative, and this is a most useful test to employ within comparatively narrow circles of affinity, as in large genera such as *Euphorbia*, where it has been done. The comparing of types belonging to the succulent and thorny scrub or Karroo with their relatives among the eastern forest flora in South Africa promises to be a very fruitful field for research.—It is realised that there may very well be exceptions in particular cases, and that the principles outlined must necessarily be applied with caution.—*Author.*

8440. Bews, J. W., and R. D. Aitken. **Researches on the vegetation of Natal.** South African Jour. Sci. 20: 285–289. 1923.—The size of the aeration system of leaves of Natal plants was estimated by injecting them under reduced pressure with fluid of known specific gravity. Leaves, even from the same tree, are found to exhibit a high degree of variability in the size of the aeration system. A well-developed intercellular space is not necessarily a mesophytic character, nor a poorly developed one a xerophytic character. Shade leaves have no greater development of intercellular spaces than sun leaves. A new calcium chloride method of measuring resistance to water loss is described. The method used for the measurement of light intensities in various plant habitats is dependent on the fact that if a mixture of KI and H_2SO_4 is exposed to light, iodine is liberated, the amount set free being directly proportional to the intensity of the light. Experiments were carried out with 21 species to test the comparative rates of drying of leaves. An autecological study of the genus *Cussonia* has been carried out.—*E. M. Doidge.*

8441. Compton, R. H. **Kirstenbosch, South African botany and nature reserves.** South African Jour. Sci. 21: 79–91. 1924.—An account is given of the development of the national botanic garden at Kirstenbosch, with particular reference to water conservation, afforestation and the preservation of the indigenous flora.—*E. M. Doidge.*

8442. Gilbert Rahm, P. **Einwirkung sehr niederer Temperaturen auf die Moosfauna. [Influence of low temperatures on the fauna of mosses.]** Verslag. K. Akad. Wetenschapp. Amsterdam **29**: 499–512. 1920.

8443. Goe, Louise, Elsie Erickson, and Edith Woollett. **An ecological study of Mud Lake bog, Cheboygan County, Michigan.** Papers Michigan Acad. Sci. **4**: 297–310. *Fig. 4–7, map 2.* 1925.—The lake is surrounded by a quaking mat containing vegetation characteristic of bogs in the northern part of the U. S. A. The common forms are *Carex filiformis, Chamaedaphne calyculata, Nemopanthus mucronata* and *Alnus incana.* Borings for peat were taken at numerous points around the lake, peat of a firm, uniform texture being found at an average depth of 7 feet at the lake margin. A table of typical H-ion readings is given, taken in 1922. A list of plants growing in the bog is appended; this list contains several species of mosses.—*H. T. Darlington.*

8444. Goor, A. C. J. Van. **Die Holländischen Meeresalgen. [The Dutch marine algae.]** Verhandel. K. Akad. Wetenschap. Amsterdam. 2 Sect. **23**^{2}: 1–232. 1923.—Chapter 1 contains an account of earlier investigations and is followed by a discussion of such physical factors as climate, tides, temperature of air and sea water, salt content, etc. Chapter 3 discusses the taxonomy of the Rhodophyceae, Phaeophyceae and Chlorophyceae of the Dutch coast, followed in the next chapter by data as to the time of ripening of the different forms. Chapter 5 contains a discussion of the coastal associations and the writer distinguishes in the littoral region associations of (1) Fucus, (2) of Polysiphonia-Chaetomorpha, (3) of Enteromorpha and (4) of Urospora. In the sublittoral region there are distinguished associations of (1) Laminaria, (2) of Zostera with Rhodophyceae, and (3) of Zostera on sand with some red and brown algae. A transition to a green algae-Zostera vegetation was found. The vegetation on sea-going vessels and on the loose stones of the sub-littoral is also described, the last part of the chapter being devoted to migration forms. Chapter 6 contains an account of the general geographic and North Atlantic distribution, some of the data being given in tables. The work is a very comprehensive one and contains a large number of new observations and views of the author.—*J. C. Th. Uphof.*

8445. Gruber, Max. **Über eine Methode zur Messung des Lichtgefälles im Wasser mit Hilfe des Eder-Hechtschen Graukeils. [A method for the measurement of light intensity in water by the aid of the gray wedge of Eder and Hecht.]** Internat. Rev. Ges. Hydrobiol. u. Hydrograph. **12**: 17–35. *Pl. 2–6.* 1924.—An account is given of the construction and mode of operation of a new photometric device for determining the intensity of light at different depths in lake waters. Results obtained by the use of the instrument in Lake Constance are included. —*Lowell E. Noland.*

8446. Halbfass, W. **Über Japanische Seen. [Japanese lakes.]** Internat. Rev. Ges. Hydrobiol. u. Hydrograph. **12**: 121–122. 1924.—The text and table give data on the depth, area, shore line, volume and productivity of 74 Japanese lakes.—*Lowell E. Noland.*

8447. Hanna, W. F. **Growth of corn and sunflowers in relation to climatic conditions.** Bot. Gaz. **78**: 200–213. *Fig. 1–4.* 1924.—To determine the effect of different climatic factors on the rate of growth, *Helianthus annuus* and *Zea mais* were grown for a number of days and their rate of growth as well as their green and dry weights were determined. During the growth of the plants, records were made of the temperature, relative humidity, precipitation and total hours of sunshine. It was found that low soil temperatures retarded the germination of the corn and sunflower seed. A temperature 24–29°F. injured the corn. The growth of the 2 plants showed a greater correlation with temperature than with any single climatic factor. The corn plant seems to be suited to regions where the growing season is long, the temperature high, and the soil moisture limited; while the sunflower thrives best in regions of low temperature and abundant soil moisture.—*L. J. Pessin.*

8448. Hitchings, B. G. **Some results of the first summer's work at the University of Maine's summer biological station at Mt. Desert Island (1924). Part V. The white pine region.** Maine Nat. **5**: 82–90. 1925.—In a forest flora of 7 species, white pine formed 74% of the stand. A list of 15 herbs and shrubs found in the more open parts of the forest is given. —*C. A. Weatherby.*

8449. Hoeg, O. **En myr under Svartisen. [A bog under Svartisen, Norway.]** Tidsskr. Skogbruk **33**: 110–114. 1925.—From analyses of buried peat, conclusions as to the history of this bog are made.—*W. H. Meyer.*

8450. Issel, Raffaele. [Rev. of: Forti, A. **Ricerche su la flora pelagica (fitoplancton) di Quarto dei Mille (Mare Ligure).** Mem. R. Comitato Talassograf. Italiano 97. *1–253. 13 pl.*] Internat. Rev. Ges. Hydrobiol. u. Hydrograph. 12: 123–124. 1924.

8451. Jespersen, P. **On the quantity of macroplankton in the Mediterranean and the Atlantic.** Internat. Rev. Ges. Hydrobiol. u. Hydrograph. 12: 102–115. *Pl. 9–13.* 1924.—This is a summary of cruises made in the Atlantic Ocean and Mediterranean Sea during the last 20 years under the auspices of the Danish Commission for the Study of the Sea. The volume of macroplankton (almost exclusively zooplankton) is compared for depths of 25–64 m. 100, 300, and 600 m. The Sargasso Sea was found to be poorest in macroplankton. The quantity of macroplankton was found to increase from the shore outward toward the deeper water, due chiefly to the increase in medusae and salps. In the Mediterranean the greatest volume was found at the western end, with a general decrease toward the east. The distribution of *Meganyctiphanes norwegica* (an Euphausiad Crustacean) in the Mediterranean Sea is discussed.—*Lowell E. Noland.*

8452. Juday, Chancey. **Summary of quantitative investigations on Green Lake, Wisconsin.** Internat. Rev. Ges. Hydrobiol. u. Hydrograph. 12: 1–12. *3 graphs.* 1924.—The size, depth, altitude, geological origin, and transparency of the water of the lake are given, followed by a summary of investigations carried out. *Chara* was found to make up 49% and *Potamogeton* 33% of the total amount (dry weight) of the larger aquatic plants. The net plankton averaged 60.4 milligrams (dry weight) per cubic meter. The maximum amount per cubic meter occurred in early summer. The nannoplankton averaged 757.6 milligrams (dry organic matter) per cubic meter. A study of the bottom fauna revealed the greatest variety of organisms in the 1–10 meter zone, with the greatest quantity of organisms in the 20–40 meter zone. The distribution and abundance of the larger bivalved molluscs were studied. —*Lowell E. Noland.*

8453. Kawagoe, Shigenori. **The market fungi of Japan.** Trans. British Mycol. Soc. 10: 201–206. 1925.—*Cortinellus edodes*, which is considered the "king of Japanese edible fungi," is limited to groves of *Pinus densiflora*, the Japanese red pine, with which it forms mycorhizas. It is never associated with other trees except, in very rare cases, with *Tsuga Sieboldii*. *Cortinellus Shiitake*, another edible mushroom, grows as a saprophyte on dead wood of trees belonging to the Fagaceae. There is such a demand for it that it is artificially cultivated on decaying wood. It is used mostly in the dried condition. *Rhizopogon rubescens* grows in sandy soil under pine trees, mostly *P. Thunbergii*. Several other edible fungi including a smut, *Ustilago esculenta*, are briefly discussed.—*W. B. McDougall.*

8454. Krogerus, Rolf. **Pellonkylä träsk. En utvecklingshistorisk studie. [Lake Pellonkylä. A historical study of its development.]** Fennia, Bull. Soc. Geog. Finlande 44: 1–39. *2 maps.* 1924.—A detailed account is given, in Swedish, of the plant associations bordering this lake, and their influence upon the filling up of the depression in which it lies. The nature of the soil is discussed, also the plankton. *Lemna triscula* is characteristic, and the diatom flora is rich. A summary in German is included.—*W. R. G. Atkins.*

8455. Lebour, Marie V. **Coccolithophora pelagica (Wallich) from the Channel.** Jour. Marine Biol. Assoc. United Kingdom n. s. 13: 271–275. 1923.—This small coccosphere occurs abundantly in the Plymouth region on the surface of the sea and down to a depth of at least 100 m. While found throughout the year, it is least common in the summer and is most numerous at the temperature 9.9–14.10°C., salinity 35.25 per 1000, and pH 8.16–8.17, in March and October. The coccoliths are used as food by various plankton or pelagic organisms. *Pontosphaera Huxleyi*, which is the only other coccosphere known in this district, has been found less frequently, but may be easily passed over owing to its smaller size.—*Marshall A. Howe.*

8456. Lee, Shun Ching. **Factors controlling forest successions at Lake Itasca, Minnesota.** Bot. Gaz. 78: 129–174. *Fig. 1–18.* 1924.—The climatic edaphic and biotic factors of the region were studied in relation to the distribution of the climax and seral communities. The various successions were worked out, the author believing the Abies-Picia forest to be destined to succeed the hardwood-Pinus type at the end of the sere. This latter, it is suggested, may be the true climax of the region. Edaphic climaxes of *Pinus resinosa*, *P. Banksiana* and hardwood-*Pinus Strobus* are recognized. The author points out that the edaphic factors, especially those of soil composition and moisture together with the factor of evaporating power of the air, are the chief limiting ones in forest successions.—*B. W. Wells.*

8457. Levyns, Mrs. M. R. **Some observations on the effects of bush-fires on the vegetation of the Cape Peninsula.** South African Jour. Sci. 21: 346–347. 1924.—Bush fires tend to destroy valuable grasses and all plants which have no underground reproductive organs with the exception of the Rhenoster bush which reproduces readily by seed, and crowds out the few grasses and other plants suitable for grazing.—*E. M. Doidge.*

8458. Levyns, Mrs. M. R. **The distribution of the seaweeds of the Cape Peninsula.** South African Jour. Sci. 21: 265–269. 1924.—The coast line of the Cape Peninsula shows a great variety of structure in slate, granite and sandstone. In a general survey of the sea-weed flora of the eastern and western coasts the following points stand out. The cold west side is much richer in species than the warmer east side, and the proportion of large thalloids amongst the browns and the reds is high on the west but very low on the east. The small size of the sea-weeds above the low neap-tide level on the east coast is striking. A list of species occurring on the various formations of the east and west coast has been compiled.—*E. M. Doidge.*

8459. Marloth, R. **Notes on the question of Veld burning.** South African Jour. Sci. **21**: 342–345. 1924.—The practice of burning the mountain veld has (1) impoverished our mountain flora by bringing about the extinction of species, (2) produced a greatly increased run-off of the rain in winter and consequently a diminished supply for the streams in summer, and (3) reduced the power of the mountain to capture the moisture brought in by the south-east clouds from the southern ocean in summer.—*E. M. Doidge.*

8460. Obaton, F. [Rev. of: Russel, E. J. **Les conditions du sol et la croissance des plantes. Traduit sur la quatrième édition anglaise par Georges Matisse. Paris. (The conditions of the soil and growth of plants.)** Translated from the *4th English ed.* by Georges Matisse. 465 p. Ernest Flammarion: Paris, 1924.] Rev. Gén. Bot. **37**: 190–191. 1925.

8461. Oye, Paul van. **Zur Biologie des Potamoplanktons auf Java. [The biology of the potamoplankton of Java.]** Internat. Rev. Ges. Hydrobiol. u. Hydrograph. **12**: 48–59. 1924.—The author reports the results of 12 monthly studies made on the plankton of a mountain stream, a lowland stream, and a brook in Java. It is claimed that the chief factors influencing the occurrence and abundance of plankton in these 3 tropical streams are aeration of water, dilution by rain water, and the stirring up of sediment by rains. Previous paper in Internat. Rev. ges. Hydrobiol. u. Hydrograph. 10: 362–393. 1922.—*Lowell E. Noland.*

8462. Pillans, N. S. **Destruction of indigenous vegetation by burning on the Cape peninsula.** South African Jour. Sci. **21**: 348–350. 1924.—The worst results of burning the veld are most evident on the lower hills and mountains in the lower part of the peninsula. The acreage of tall shrub-formation has been greatly reduced by fires; formerly every ravine and the banks of mountain streams were clothed with shrubs or trees; these tracts are now often quite bare, and it is only the bulbous and deeply rooted plants which can subsist in the arid conditions which prevail during the summer.—*E. M. Doidge.*

8463. Rayner, M. C. **The vascular plants characteristic of peat: a criticism.** New Phytol. 23: 288–292. 1924.—This is a critical discussion of a paper by Hinchliff and Priestley (Naturalist, July, 1924) in the light of previous work by the author.—*I. F. Lewis.*

8464. Salisbury, E. J. **Some impressions of the International Phytogeographic Excursion in Switzerland, 1923.** Jour. Ecol. **13**: 161–164. 1925.—This excursion was held in Switzerland in July and August and attended by 28 ecologists in addition to the Swiss leaders. A record is given of the localities visited and some of the most notable features of the vegetation are described.—*Geo. D. Fuller.*

8465. Salisbury, E. J. **The incidence of species in relation to soil reaction.** Jour. Ecol. **13**: 149–160. *10 fig.* 1925.—Emphasizing the facts that the causes of soil acidity are various, that the reaction of an undisturbed soil is fairly constant throughout the year, and that the soil reaction is only 1 of many factors which determine the nature of the plant covering, this author plots frequency curves for several plants, with the pH values as abscissae and the number of localities as ordinates. These curves for the different species do not exhibit modes corresponding to the same pH value as they would if they were determined by the frequency of soils of a particular reaction, and some of the species exhibit a bimodal form, whereas the soil curve is monomodal. It is concluded from these and other data that for land plants the basic ratio for potassium to calcium has little if any significance and that the main factor which is responsible for the incidence of species is the reaction of the soil, which is 1 of several important factors that govern the distribution of plants in a wild state.—*Geo. D. Fuller.*

8466. Schubert. [Rev. of: Bindemann, H. **Die Verdunstungsmessungen der Preussischen Landesanstalt für Gewässerkunde auf und an dem Grimnitzsee und am Werbellinsee bei Joachimsthal in der Ackermark. (Evaporation studies by the Prussian state institute of marine science on and adjacent to Grimnitz Lake and Werbellin Lake near Joachimsthal in Ackermark.)** Jahrb. Gewässerkunde Norddeutschlands. Besondere Mitteil. Bd. 3, Nr. 3, Ernst Mittler and Son; Berlin, 1921.] Zeitschr. Forst.- u Jagdw. **55:** 599–600. 1923.—The observations of evaporation from a known area of water surface were made in special pans immersed in water in such manner that the contained water was subject to the same conditions as the exposed lake surface. With increasing dryness of the air or saturation deficit on shore, the increase of evaporation on the lake surface is not as rapid as on shore. The mean yearly evaporation on Lake Grimnitz was approximately 940 mm. Under shelter on the west shore it was 552 mm.; in Potsdam (meteorological observatory) 357 mm. The average annual precipitation was approximately 600 mm. A comparison of evaporation on Lake Grimnitz with that on Lake Werbellin (72%) and in Potsdam (65%) indicates that evaporation is greatly influenced by local conditions. It, therefore, appears possible to reduce wind velocity and accompanying evaporation by filling out and securing greater height growth in the forest belt on highlands surrounding bodies of water.—*J. Roeser.*

8467. Strøm, K. Münster. **pH-values in Norwegian mountains, and their bearings upon the classification of freshwater localities. A reconnaissance.** Nyt Mag. Naturvidensk. [Oslo] **62:** 237–244. 1925.—The values of pH in 71 different bodies of water in a Norwegian mountain region have been examined; they ranged from 3.8 to 8.5. Aëration and stagnation played the most important part in determining the pH, the mean value of which was 7.6 in 10 typically aerated localities (irrorated rocks, brooks), and 4.5 in 35 typically stagnant habitats (bogs, peaty ditches, small tarns in the swamps).—In peaty bogs the CO_2- assimilation by the algæ never sufficed to raise the pH-value to any appreciable extent, but when such water was aërated in brooklets, etc., the reaction soon approached the neutral.—Under sub-arctic conditions near Finse, peaty *Sphagnum*-swamps are little developed, and the majority of even the stagnant localities are well aërated with slightly acid or neutral reaction, and this is of importance in the distribution of Arctic algæ.—The specific reaction of the water is a potential factor in determining the character of the biota in general, and especially the algal flora, but it must always be regarded in conjunction with the other physical and chemical properties of the medium.—*Author.*

8468. Twichell, D. S., and M. B. Harris. **Some results of the first season's work of the University of Maine's summer biological station at Mt. Desert Island. II. Pitch pine region, Pickett Mountain.** Maine Nat. **5:** 11–23. *3 pl.* 1925.—According to Moore, the south slope of Pickett Mountain is the driest and warmest portion of Mount Desert Island. It is an abrupt ledge more or less arranged in shelves or benches. In crevices of the rock grow stunted individuals (12–20 feet high at an age of about 120 years) of *Pinus rigida,* a southern species. With them is an undergrowth of 15 species, 9 of them shrubby. An attempt at an ecological correlation of fauna and flora was made; in each case physiographic conditions operated to limit the number of types found, and apparently also their size. All the fauna were of dull coloration.—*C. A. Weatherby.*

8469. Twichell, E., and R. Crockett. **Some results of the first summer's work at the University of Maine's summer biological station at Mt. Desert Island (1924). Part IV. Report of the mixed conifer region on Pickett Mt.** Maine Nat. **5:** 65–81. *2 pl.* 1925.—The region, lying on the northeast slope of Pickett Mt. and bearing a mixed forest apparently approaching a spruce climax, was divided into 5 sections for study. Percentage frequencies of 7 forest trees are given and the distribution of 29 herbs and shrubs among the 5 sections is shown in a table. Lists of insects are given.—*C. A. Weatherby.*

8470. Voorhees, J. F. **A preliminary study of effective rainfall.** Monthly Weather Rev. **53:** 63–65. *1 fig.* 1925.—Water content of the soil does not change appreciably from year to year; the difference is due to losses from run-off, evaporation or by transpiration. The latter may be increased at the expense of run-off by increasing the number and vigor of plants. In the Knoxville, Tennessee, region, the rainfall is sufficient to double present annual yield of agricultural crops.—*E. N. Munns.*

8471. Wherry, Edgar T. **Soil acidity preferences of some eastern conifers.** Jour. Forest. 20: 488–496. 1922.—As preferring acid habitats but found also on intermediate ones, the author lists *Pinus palustris* Mill., *P. rigida* Mill., *P. pungens* Lamb., *P. Banksiana* Lamb., *Picea rubra* Dietr., *Picea mariana* B. S. P., *Abies fraseri* Poir., and *Chamaecyparis thyoides* B. S. P.; as preferring intermediate but found also on acid, *Pinus taeda* L., *P. serotina* Michx., *P. echinata* Mill., *P. resinosa* Ait., *Abies balsamea* Mill., and *Tsuga caroliniana* Engelm.; as preferring intermediate but found also in circumneutral, *Pinus virginiana* Mill., *Pinus strobus* L., *Taxodium distichum* Rich., *Taxodium ascendens*, *Juniperus communis depressa* Pursh, *Tsuga canadensis* Carr., and *Taxus canadensis* Marsh; as preferring circumneutral but found also in intermediate, *Larix laricina* Koch, *Thuja occidentalis* L., and *Juniperus virginiana* L.—He defines the habitats in terms of specific acidity, mentions the region in which each species was studied, and comments on the effect of acidity preferences on distribution, reproduction, reforestation, and values of conifers as soil indicators.—*Philip C. Wakeley.*

8472. Whistler, Hugh. **In the High Himalayas: Sport and travel in the Rhotang and Baralacha; with some notes on the natural history of that area.** *223 p. 16 pl.* H. F. & G. Witherby: London, 1924.

STRUCTURE, BEHAVIOR, SYMBIOSIS

8473. Clark, J. Edmund. **International cooperation in phenological research.** Nature 115: 602–603. 1925.—Some suggestions for observation are made and a list is given of 42 species of plants with their dates of flowering (ranging from Jan. 19 to Dec. 12). It is suggested that persons who will cooperate forward a list of these species which they can report upon.—*O. A. Stevens.*

8474. Delf, E. M., and J. H. Priestley. **Ecology of Moorland plants.** Nature 115: 380–381. 1925.—Two separate communications under one title, referring to an earlier article by J. H. Priestley on *Calluna*. Delf argues that the significant character of xerophytes is their ability to endure reduction of water in the tissues and that this has not been studied sufficiently for British Ericaceae. Priestley regards these comments as not relevant.—*O. A. Stevens.*

8475. DuMond, F. L. **Branch orders and tolerance.** Jour. Forest. 20: 448–462. 1922. —Study of 22 important tree species in southern Connecticut shows that the number of branch orders is not an accurate indication of tolerance. The variation between maximum numbers of branch orders is insufficient to make clear-cut the distinctions between species, and the maximum number within species is too much affected by site, size, age, position of crown, position of limbs, history of stand, diameter of ultimate twig and area of individual leaf.—*Philip C. Wakeley.*

8476. Huff, N. L. **Observations on the relation of algae to certain aquatic animals of Vadnais Lake.** Minnesota Studies Plant Sci. (Studies Biol. Sci. 4) 1: 185–197. *Fig. 1–3.* 1923.—The author presents text figures showing the rise and fall of the phytoplankton and zooplankton in the lake, and comes to the conclusion that protozoans, crustaceans, and rotifers draw their major food supply from dead and decaying refuse from seed plants, as treating the lake with copper sulphate to reduce the phytoplankton had little or no effect on the zooplankton. A modified Sedgwick-Rafter cell to count the zooplankton is described, as well as the species of algae predominating in the phytoplankton at the time of the different treatments with copper sulphate.—*L. O. Regeimbal.*

8477. Lovell, J. H. **The bees of Maine, part III.** Maine Nat. 5: 7–10. *1 pl.* 1925.—This contains notes on the plants visited by different species of bees.—*C. A. Weatherby.*

8478. Millar, C. E. **The feeding power of plants in different soil horizons.** Jour. Amer. Soc. Agron. 17: 150–156. 1925.—The comparative growth of oats and inoculated sweet clover on the different horizons of Fox sandy loam and Miami silt loam indicate that different crops may have quite markedly different feeding powers on the various soil horizons.—*F. M. Schertz.*

VEGETATION

8479. Aldous, A. E., and H. L. Shautz. **Types of vegetation in the semiarid portion of the United States and their economic significance.** Jour. Agric. Res. 28: 99–127. *16 pl.*

map. 1924.—More than a hundred different plant associations or types of vegetation are described briefly and their distributions indicated on a map of the western U. S. A. The agricultural possibilities of the regions covered by these associations are discussed and several of the associations are presented in plates from photographs.—*Geo. D. Fuller.*

8480. Beauchamp, P. de. **Etudes de bionomie intercotidale: les iles de Ré et d'Yea. [Intertidal bionomic studies: the isles of Ré and Yeu.]** Archiv. Zool. Exp. Gén. **61**: 455–520. *12 fig. 2 maps.* 1923.—This study, illustrated by photographs, deals with the distribution of the principal animal and plant associations, and their variations according to level, facies, and aspects (le mode) according to principles proposed by the author in 1914 for the region of Roscoff, 4 zones being defined in their relation to mean high tide.—The isle of Yeu off the granitic shores of Bretagne, exhibits all the algal associations of the region and in addition possesses an important southern species, *Tenarea tortuosa,* here at its northern limits, occurring in the upper Fucus zone (zone II of the author). The topographic features lend themselves particularly well to the study of succession in passing from the sheltered north and east shore to the wave-beaten south shore. In the former situations, at the height of 4 m., are seen typical successions of *Pelvetia canaliculata, Fucus platycarpus, F. vesiculosus,* (with *Ascophyllum nodosum*) and *F. serratus.* Towards the open sea *Ascophyllum* disappears but *Hiamanthalia lorea* comes in below, *Fucus* begins to disappear above and takes on special forms, while *Pelvitia* thins out and is then replaced by an equivalent band of *Lichina.* The space abandoned by *Fucus* is occupied by open associations of *Tenerea* and *Lichina* and to a less degree by *Nemalion, Rivularia, Cylindrocarpus* and various animals. In the author's zone III, that of *F. serratus,* a large role is played by short thick stands of *Laurencia, Gigartina, Gelidicum,* and *Corallina,* up to a level determined by exposure. The association of the Laminariaceae, below O m., presents no notable variations. Stands of *Zostera marina* exist only at very sheltered points. —The isle of Ré, situated a little farther south, but of calcareous rock presents quite different characters. The almost horizontal strata go far out under the waves so that the wave-beaten coast hardly exists. This no doubt accounts for the absence of *Tenarea* and several other forms. The covering of *Fucus* is everywhere dense but *Ascophyllum* and *Pelvetia* are comparatively little developed, *Himanthalia* disappears, but the Florideae of the lower zones are richly developed and quite different from those of the other isle. Stands of *Zostera nana* are very well developed on the north shore.—*Author (translated).*

8481. Beauchamp, P. de. **Quelques remarques de bionomie marine sur les îles Chausey. [Marine bionomy on the Chausey isles.]** Bull. Soc. Zool. France **48**: 84–95. 1923.—This report resembles the preceding Entry, it is more condensed but the facts are similar. This archipelago is characterized by tides of considerable height and by very sheltered shores between the islets where deposits of mud are considerable. It results in an exuberant development of the zones of the Fucaceae (without *Himanthalia*) at a height of 10 m. while the Laminariaceae are comparatively little developed and the Florideae show some special characters. At certain points *Codium bursa* and *C. adhaerens* form an association in Zone III. The muds at the higher levels exhibit very characteristic associations of *Fucus lutarius* and *Zostera nana,* mingling at certain points with halophytie seed plants. Meadows of *Zostera marina* cover vast surfaces.—*Author (translated).*

8482. Cockayne, L. **On the occurrence of subalpine vegetation at a low level in the Fiord Botanical District (New Zealand) and other matters pertaining thereto.** Flora **118, 119**: 75–80. 1925.—The author asserts that there is a subantarctic climate in New Zealand characterized by many rainy days with cold rains or sleet, no great extremes between the summer temperature which is low and that of winter, very frequent cloudy skies and but little bright sunshine, a low snowfall, and frequent violent gales. Correlated with these climatic conditions is a deep peaty soil.—He described the vegetation of an area at 45° 30′ S. Lat. where on an elevation of 457 m., surrounded by a forest of *Nothofagus Menziesii,* there is an area destitute of trees and covered with low growing plants and shrubs. These may be grouped into 3 associations,—(1) wet herb field, (2) shrubland and (3) low forest. A list of the species of these associations shows that all are common members of the sub-alpine flora of New Zealand, usually found at much higher altitudes, several being purely mountain species.—It would seem that within the climate described the occurrence of high mountain plants is not a matter of altitude but of opportunity in competition with the forest.—*Geo. D. Fuller.*

8483. Fuller, Geo. D. **The vegetation of the Chicago region. An outline of the principal plant associations together with lists of their principal species.** 27 p. Univ. Chicago Press: Chicago, 1925.—The different plant associations of northern Illinois and Indiana, U. S. A., are briefly described and lists of species are given for each. These include the associations of the uplands, sand dunes, prairie, ponds, bogs, river banks and flood plains.—*Author.*

8484. Hauman, L. **La vegetacion primitiva de la ribera Argentina de Rio de la Plata. [The primitive Argentine vegetation of the Rio de la Plata.]** Rev. Centro. Estud. Agron. y Veterin. [Buenos Aires] **96**: 1–13. *6 fig.* 1919.—The author, having observed the profound modifications leading to the complete destruction of the primitive vegetation about Buenos Aires, describes a point on the banks of the Rio de la Plata, 30 km. down stream from the city, where the bordering vegetation is almost primitive. The arborescent species are *Ocotea acutifolia* Mez, *Pouteria salicifolia* Radl., *Cytharexylon barbinerve* Cham., *Rapanea Lorenziana* Mez, *Alophilus edulis* Radl., *Celtis glycicarpa* Mart., *Erythrina*, *Salix*, *Sebastiania* and *Bambusa Trini* Nees. In addition there are lianas, shrubs and numerous herbaceous species, which are listed.—*Author* (*translated*).

8485. Johansen, Fritz. **The vegetation of the Arctic Coast between Point Barrow, Alaska and Bathurst Inlet, N. W. T., Canada.** Rept. Canadian Arctic Expedition 1913–1918. Vol. 5 (Pt. C). *85 p. Pl. 1–14. 4 maps.* 1924.—The topography and climate of various sections of the coast are described in detail. The topographic areas include the Arctic Mountains of Alaska, the plateau and the coastal plain.—The vegetation of the mainland is richer than that of the coastal islands. On the sand bars and dunes rhizome development is excessive, individual plants occupying large space and species of *Elymus*, *Epilobium*, *Carex* and *Arctagrostis* grow in extensive colonies.—On the coastal plain low tundra is extensive with an abundance of *Carex* and *Eriophorum*. It passes into upland tundra in which species of *Betula*, *Salix*, *Empetrum*, *Ledum* and *Vaccinium* are abundant. Extensive lists of species are given for these associations as they are developed in different localities.—*Geo. D. Fuller.*

8486. Johnson, Douglas. **The New England-Acadian shoreline.** *xx + 628 p. 273 fig.* John Wiley & Sons: New York, 1925.—This volume, with its detailed discussion of various types of shore line, is of decided interest to ecologists studying shore vegetation. In addition to describing the physical substrata for shore plants, it presents a rather detailed study of salt marshes. The different theories accounting for the origins of such marshes are discussed and that propounded by Mudge, that the marsh is usually a record of a progressive subsidence of the land during the time of its formation, is favored. There seem to be 3 rather distinct types of such marshes designated from the regions of their development, (1) New England type; (2) Fundy type and (3) Coastal plain type. The 1st type usually exhibits 3 distinct rather broad zones characterized by *Juncus Gerardi*, *Spartina patens* and *S. glabra* respectively, and developed upon a substratum consisting largely of salt marsh peat. The 2nd type has much more silt in its substratum and much narrower strips of vegetation. The 3rd type is more closely related to the 2nd but differs somewhat from it in the character of the silt and in the floristic composition of the vegetation. Variations from these types are discussed and many examples are cited. Extensive bibliographies are appended to each chapter.—*Geo. D. Fuller.*

8487. Sears, Paul Bigelow. **The natural vegetation of Ohio. I. A map of the virgin forest.** Ohio Jour. Sci. **25**: 139–149. *5 fig.* 1925.—Using as sources of information the records and field notes of the first land surveys of the State, dating back to 1786, county histories and the journals of travelers, the author has attempted to discover the character of the original vegetation of the state. The most abundant trees seem to have been oak, beech and ash representing respectively forest associations of (1) *Quercus* and *Carya*; (2) *Fagus grandifolia* and *Acer saccharum* with a sprinkling of *Fraxinus americana* and *Quercus rubra*; and (3) *Fraxinus americana*, *F. nigra*, *Ulmus americana* and *Acer saccharinum*. The distribution of these associations within the glaciated area seems primarily correlated with the morain system. Unmixed beech appears to have been limited to the glaciated region and ash to have been best developed within the Erie plain. The influence of groups of species outside of Ohio is also discussed. Maps present the results of these studies in graphic form.—*Geo. D. Fuller.*

8488. Wimmer. **Die Bedeutung der Samenprovenienz bei der Eiche. [The importance of the seed area of the oak.]** Mitteil. Deutsch. Dendrol. Ges. **33**: 165–168. 1923.—In oaks there are several climatic races which are physiologically adapted to certain areas. They are valuable for breeding purposes. The writer distinguishes from the available material (1) a very late zone, insular climate, (2) an early zone, warm climate; (3) a relatively early zone with temperate climate; (4) a late zone and cool climate; (5) a relatively late zone and cold climate; and (6) a very late zone and very cold climate. He graphically presents horizontal and vertical zones of the oak area according to phenological observations.—*J. C. Th. Uphof.*

FLORISTICS

8489. Anonymous. **Vanished plants of our local flora.** Missouri Bot. Gard. Bull. **10:** 28–29. 1922.—Forty-eight plants are reported to have probably disappeared from the region covered by the "Preliminary check list of the cryptogams and phanerogams in the vicinity of St. Louis, Missouri" published by the Engelmann Botanical Club, 1911. The list is tabulated as to cause of disappearance.—*O. T. Wilson.*

8490. Cloudman, A. M. **Some results of the first season's work of the University of Maine's summer biological station at Mt. Desert Island. III. A preliminary report of the Cerambycidae found in eleven different regions on Mt. Desert Island.** Maine Nat. **5:** 23–35. 1925.—The regions concerned are ecological and determined by the facies of the vegetation. The species of *Cerambycidae* found in each are listed, with notes on the plants frequented.—*C. A. Weatherby.*

8491. Coburn, Louise H. **The gentians of Somerset County [Maine].** Maine Nat. **5:** 61–63. *1 pl.* 1925.—Stations for *Gentiana crinita, G. linearis* and its var. *latifolia,* and *Halenia deflexa* are mentioned.—*C. A. Weatherby.*

8492. Curson, H. H. **Outline of the floral regions of Zululand.** South African Jour. Sci. **20:** 323, 346. *Pl. 10–12, Map.* 1923.—Zuzuland may be divided into the following botanical regions, corresponding more or less with the physical regions: (1) The Lowveld, including dune bush, coastal forest, coastal grassveld coastal palmveld, coastal bushveld and inland bushveld; (2) the Middeveld consisting of valleys with dense bushveld, and ridges with open bushveld and (3) the Highveld consisting of grassveld and forest. Each of these regions is briefly described and lists given of plants collected in different areas.—*E. M. Doidge.*

8493. De Wildeman, E. **Les bambous au Congo.** **[Bamboos of the Congo.]** Ann. Soc. Sci. Bruxelles **43**¹: 110–116. *Map.* 1923.—A review of observations on the distribution of the bamboo in Africa, especially in the Congo region. References are made to the relation of distribution to such ecological factors as altitude, soil and atmospheric moisture, and geology, but because of the lack of knowledge of these factors in Africa no definite conclusions are drawn.—*Hugo L. Blomquist.*

8494. Fernald, M. L. **Isolation and endemism in northeastern America and their relation to the age-and-area hypothesis.** Amer. Jour. Bot. **11:** 558–572. *9 maps.* 1924.—The author points out difficulties in an application of the age-and-area hypothesis in a world where conditions are far from static. He presents an analysis of the floras of the area surrounding the Gulf of St. Lawrence, and shows that the species of the unglaciated mountains (which are presumably the most ancient element in the vegetation) have much narrower ranges than the younger flora, the members of which have come in since glacial times from the coastal plain or from Laborador. This fact is contrary to what would be expected on the hypothesis of age-and-area. He also observes that the largest genera of dicotyledons in temperate North America which, from their large size, should be the most ancient members of their respective circles of affinity, are for the most part unrepresented among the most ancient living floras (those of Australia, New Zealand and South Africa) but appear to have arisen in land areas of comparatively recent origin and thus are to be considered as relatively young rather than relatively old.—*E. W. Sinnott.*

8495. Forbes, Helena M. L. **A note on the flora of Salisbury Island (Durban Bay).** South African Jour. Sci. **20:** 304–308. *Pl. 7–8.* 1923.—Salisbury Island is botanically interesting on account of 3 distinct types of plant formations found, namely, dense mangrove swamp, coast bush, and inland bush. A short account of each formation is given, and a list of plants found in the island.—*E. M. Doidge.*

8496. Gleason, H. A. **Age and area from the viewpoint of phytogeography.** Amer. Jour. Bot. **11:** 541–546. 1924—The importance of the hypothesis of age-and-area is emphasized by the author. He calls attention, however, to a number of factors which make a simple application of this principle difficult. Among these are retreating migrations, differences in rate of migration and differences in physiological plasticity.—*E. W. Sinnott.*

8497. Good, Ronald. **The geographical affinities of the flora of Jebel Marra.** New Phytol. 23: 266–281. *2 fig.* 1924.—Jebel Marra is a volcanic massif some 55 miles long and 25 wide, located in Africa at about 13° N. and 24° E. Three altitude zones are 4,000–6,000 feet, 6,000–8,000, and 8,000–10,100 feet. Jebel Marra forms a connecting link between the mountains of North Africa and those of the central tropical region. The flora is small but very generalized. The 145 species belong to 53 families and 127 genera. Of the genera, 84% are above average size. The 5 endemic species are closely related to tropical African forms. The flora is composed of 4 elements, (1) cosmopolitan, (2) tropical African, (3) Afro-Indian, and (4) Mediterranean-West Asian. The closest relationship is with northeastern Africa (127 common spp.), next with tropical Africa (107 common spp.), and very little with northwestern Africa (26 common spp., all widespread forms). The flora is a derived one; Jebel Marra is not a center of distribution. It is suggested that migrations resultant upon the glacial period explain the constitution of the flora.—*I. F. Lewis.*

8498. Greenman, J. M. **The age-and-area hypothesis with special reference to the flora of tropical America.** Amer. Jour. Bot. 12: 189–193. *1 map.* 1925.—The distribution and probable history of the species of 3 sections of *Senecio* in tropical America, Convolvuloidei, Streptothamni and Fruticosi, each of which has an extensive and continuous north-and-south range, indicates that there has been a relatively rapid northward migration along 2 routes, as far as east-central Mexico and Cuba; and that species within the same group show a more or less definite relation between the area occupied and the age of the species, as shown by the greater stability in morphological characters or species occupying large areas as compared with those occupying small ones, thus agreeing in general with the age-and-area hypothesis. All these species appear to be relatively recent in origin and to have arisen not through large mutations but through natural selection during rapid northward migration.—*E. W. Sinnott.*

8499. Lemasson. **Sur la présence de "Gentiana ciliata" à Bruyères.** Bull. Soc. Sci. Nancy Ser. IV. 1: 137–138. 1922.—Two km. from Bruyères [Dept. of Vosges, France] on a hill 500 m. high, *Gentiana ciliata* L. was found September, 1919, in sandy soil among pines. This species is common in calcareous soils and was hitherto unknown in sandy ground.—*A. Chase.*

8500. McCrea, R. H. **Flowering in the north of England in 1922 and 1923.** New Phytol. 23: 207–216. *Fig. 1–4.* 1924.—Flowering dates are given for Derbyshire and (in late summer) Yorkshire for 1922 (212 spp.) and 1923 (243 spp.). A general correspondence is shown in time of flowering and mean temperatures and between flowering dates and weekly temperature deviations.—*I. F. Lewis.*

8501. Oliver, F. W. **Spartina Townsendii, its mode of establishment, economic uses and taxonomic status.** Jour. Ecol. 13: 74–91. *1 pl., 8 fig.* 1925.—This species, discovered at Southhampton [England] in 1870 and appearing afterwards at Bayonne [France], has become established at various points on either side of the English Channel where it has come to occupy considerable areas of salt marsh. These areas, with the time of their establishment, are mapped. The plant may be a sport, a mutant or a hybrid. It shows extreme vegetative vigor but gives no indication of segregation. Growing normally in soft tidal mud it often invades and replaces communities of *Zostera.* Appearing as single plants, the *Spartina* expands rapidly (several feet per year) through the agency of stolons. Long anchoring and short nutritive roots are produced.—The grass is readily eaten by cows, sheep and other domestic animals, tending to show that it may become a valuable fodder plant. Seed seems to be produced rather freely, a high percentage germinates speedily and the young plants grow rapidly so that the 2nd year the plant forms a tussock 6–12 inches in diameter. It seems well adapted for reclaiming areas of tidal mud. Its taxonomic status is the more complicated because although *S. Townsendii* is not recorded for America the most closely related forms seem to be those of American shores.—*Geo. D. Fuller.*

8502. Pampanini, R. **Gli esponenti più rimarchevoli e più rari della flora toscana nel censimento dei Monumenti Naturali d'Italia. [The most remarkable and rare exponents of the Tuscan Flora on the occasion of the census of the Natural Monuments of Italy.]** Nuovo

Gior. Bot. Italiano n.s. 32: 5–35. 1925.—A list is given of 38 terrestrial and 15 aquatic and marsh plants, rare for Tuscany, Italy, whose destruction should be prohibited by law. *Hibiscus roseus*, *Cistus laurifolius* and *Chamaerops humilis* are the ones mostly threatened by extinction in this region.—*P. D. Caldis.*

8503. Peck, Morton E. **A preliminary sketch of the plant regions of Oregon. I. Western Oregon.** Amer. Jour. Bot. 12: 33–49. *1 fig.* 1925.—The following plant regions of western Oregon are described and their most abundant and characteristic species listed: Northern coast, northern coast mountain, Willamette Valley, Rogue-Umpqua, southern coast, and southern coast mountain and Siskiyou.—*E. W. Sinnott.*

8504. Peck, Morton E. **A preliminary sketch of the plant regions of Oregon. II. The Cascade mountains and eastward.** Amer. Jour. Bot. 12: 69–81. 1925.—The following plant regions of eastern Oregon are described and their most abundant and characteristic species listed: Cascade, eastern Oregon (including the Columbia river area, the yellow pine, the bunch-grass and sagebrush, and the lake areas); and the Blue mountain region.—*E. W. Sinnott.*

8505. Praeger, R. Lloyd. **A Fuerteventura diary.** New Phytol. 23: 216–221. 1924.—Fuerteventura is 1 of the 2 easternmost islands of the Canary group. It has a rainfall of 5 or 6 inches which comes mainly in winter. Notes on the vegetation of this desert island are given from the diary of a visit in March, 1924.—*I. F. Lewis.*

8506. Robyns, W. **The geographical distribution of the genus Sphaeranthus.** New Phytol. 24: 124–128. *Fig. 1–6.* 1925.—The central area of distribution of *Sphaeranthus* is in East Africa and India, suggesting a former close geographical connection. The primitive headquarters of the genus are probably East Africa.—*I. F. Lewis.*

8507. Sibilia, Cesare. **Di alcuni esemplari di "Linaria Cymbalaria" Mill. a fiori bianchi. [Some specimens of Linaria Cymbalaria Mill. with white flowers.]** Annali di Botanica 16: 241–243. 1924.—A specimen of *Linaria Cymbalaria* was found with perfectly white flowers. The change in color was accompanied by other changes such as smaller dimensions of the plant in general, less conspicuous veins, green pericarp, etc. Such variations in this plant have been reported by other authors also. Seed from such plants as well as the plants themselves on being planted in the garden of the Botanical Institute of Panisperma, in Rome, produced the normal purple flowers only. The author concludes that the white-flowering individuals are due to environmental modifications such as intense light and calcareous soil and cannot be considered either as forms, or as a variety of the purple flowering plant.—*P. D. Caldis.*

8508. Watson, W. **The bryophytes and lichens of arctic-alpine vegetation.** Jour. Ecol. 13: 1–26. 1925.—The climate and vegetation of the higher mountains of Scotland show characters peculiar to both the alpine and arctic regions. The lichens and bryophytes are more alpine than the flowering plants. Some of the factors which strongly affect vegetation in these regions are the great variability in the relative humidity of the air, the violent and continuous air movements, the great and rapid fluctuations of temperature and the high rate of evaporation. The conditions of development and lists of species are given for the following: (1) Moss-lichen open association; (2) *Rhacomitrium* heath association (closed); (3) Snow-patch vegetation; (4) Rock face associations; (5) Rock ledge association; (6) Shade chomophyte association; and (7) Hydrophilous chomophyte association. The altitudinal distribution is given for a long list of Bryophytes and lichens.—*Geo. D. Fuller.*

FORESTRY

W. N. Sparhawk, *Editor*

(See also in this issue Entries 8369, 8387, 8394, 8397, 8441, 8448, 8456, 8466, 8468, 8469, 8471, 8475, 8484, 8487, 8488, 8492, 8883, 8909, 8920, 8938, 9125, 9126, 9131, 9139, 9142, 9172, 9235, 9247, 9248, 9256, 9281, 9318, 9319, 9524, 9576, 9634, 9645, 9656, 9557, 9672, 9673)

8509. Anonymous. **Der Forstdienst und das forstliche Versuchswesen in den deutschen Schutzgebieten. [Forest service and forest investigations in the German Protectorates.]** Tropenpflanzer 25: 173–175. 1922.—Forest conditions and the status of forest research in German East Africa, Cameroons, German South West Africa, Togo, and German New Guinea are described.—*J. C. Th. Uphof.*

8510. Anonymous. **Erfolgreiche Bekämpfung der Forleule und Nonne im Juni 1925. [Effective combatting of owl and nun moths.]** Deutsch. Forstzeitg. 40: 654. 1925.—A finely powdered calcium arsenate preparation, dusted on the forest from an airplane, was very effective in killing the caterpillars. Another successful method was the explosion, by means of an electric spark, of pots containing an unnamed poison that were placed at intervals under the trees.—*W. N. Sparhawk.*

8511. Anonymous. **Experimental forestry, forest protection and timber products export.** (Excerpt from the complete catalogue in Swedish.) *66 p. 19 fig.* Jubilee Exhibition: Gothenburg, 1923.—The organization and some of the important projects of the Institute for Experimental Forestry are described (*48 p.*); the work of the Forest Protection Boards is outlined (*11 p.*); and data on production, prices, and exports of timber are presented.—W. *N. Sparhawk.*

8512. Anonymous. **Grøftning med dynamitt. [Ditching with dynamite.]** Tidsskr. Skogbruk **33:** 115–125. *2 fig.* 1925.—It is concluded that dynamiting cannot generally compete with hand labor for draining forest lands although it is a valuable supplement to hand work.—*W. H. Meyer.*

8513. Anonymous. **Perpetual forests in New Zealand.** Timberman 26^7: 49. *4 fig.* 1925.—Figures from several sources show the forest areas, the need for reforestation, and the rates of growth of Monterey pine and eucalypts.—*Duncan Dunning.*

8514. Anonymous. **Skogens gjenreisning i Provence's fjeldstraekninger.** [Rev. of: Bauby, Ph. **Le reboisement en Provence. (Reforestation in Provence.)** Rev. Eaux et Forêts **62:** 357–361. *4 pl.* 1924.] Tidsskr. Skogbruk **33:** 105–110. 1925.

8515. Anonymous. [Rev. of: Drummie, A. C. **Practical forestry: from a workman's point of view.** *xii + 340 p.* G. Routledge & Sons: London, 1924 (see Bot. Absts. 14, Entry 3349).] Nature **115:** 375. 1925.—The book is not suitable for those who require accurate description and scientific method.—*O. A. Stevens.*

8516. Anonymous. [Rev. of: Jones, W. S. **Timbers: their structure and identification.** *xi + 148 p.* Clarendon Press: Oxford; Oxford Univ. Press: London, 1924 (see Bot. Absts. 14, Entry 3361).] Nature **115:** 601. 1925.

8517. Anonymous. [Rev. of: Koehler, Arthur. **The properties and uses of wood.** (Univ. Wisconsin Ext. Texts.) *xiv + 354 p.* McGraw-Hill Publ. Co.: London, 1924 (see Bot. Absts. 14, Entry 6251).] Nature **115:** 527–528. 1925.

8518. Anonymous. [Rev. of: Nuttall, G. Clarke. **Trees and how they grow.** *New ed. xi + 184 p. 70 pl.* Cassell & Co.: London, New York, Toronto and Melbourne, 1923 (see Bot. Absts. 14, Entry 255).] Nature **115:** 564. 1925.—A number of errors in derivation of names are noted.—*O. A. Stevens.*

8519. Adler, Paul. **Die Forleule und ihre Bekämpfung. [Combatting the pine owl moth.]** Deutsch. Forstzeitg. 40: 594–597. 1925.—Information is given regarding the migrations of the moth (*Noctua piniperda* or *Panolis flammea* Schiff.) which has been known in Russia for many years and is believed to have originated in Asia. The best method of control is to destroy the pupae by cultivating the soil under defoliated stands thoroughly and repeatedly during the summer and fall and again the following spring. The timber should not be cut until May or June of the year following defoliation.—*W. N. Sparhawk.*

8520. Akerman, Alfred. **The forests of Brunswick County, Virginia.** Virginia Forest. Publ. 32. *1–15. 2 pl.* 1924.—The topographic, climatic, economic and forest conditions in the county are described. Ways of bringing the forest land, which comprises about 70% of the area, into productivity are discussed.—*C. F. Korstian.*

8521. Albert. **Zur Kohlensäurefrage. [The carbon dioxide question.]** Zeitschr. Forst- u. Jagdw. **55:** 711–714. 1923.—All the methods of soil cultivation used in recent silvicultural systems have for their primary object the improvement of soil moisture conditions, not of CO_2 conditions. The increased amount of CO_2 made available by these measures is practically lost to young plantations, and can affect tree growth only when the stands are fully closed. The effects of soil cultivation are noticeable long before this stage is reached. Silvicultural measures such as the maintenance of mixed, uneven-aged stands, the careful choice of species, and nursing of the soil and stand, tend to keep forest soil in a state of high fertility. They also create optimum living conditions for the CO_2-producing soil organisms and hinder the loss of this valuable gas through the atmosphere.—*J. Roeser.*

8522. Allen, E. T. **Pacific Coast forestry research.** Timberman 26^7: 178, 180, 182, 184. (Comments by several others, 40–41, 48.) 1925.—As a result of the 1st season's work in a program of research begun in 1924 in the Pacific Northwest and in California, the conclusions of other investigators are seriously questioned, notably as to the importance of stored seed in reproducing Douglas fir and of advance reproduction in regenerating western yellow pine. The dangers of forest devastation by lumbering and fire are minimized.—*Duncan Dunning.*

8523. Allison, J. H. **The Lake Vadnais plantations, St. Paul, Minnesota.** Jour. Forest. **20**: 538–544. 1922.—Data are presented on the establishment and growth of white, jack, and Scotch pines, white, red, Norway and Colorado blue spruces, and balsam fir, in a 140-acre plantation.—*Philip C. Wakeley.*

8524. Baker, H. L. **The forests of Lee County, Virginia.** Virginia Forest. Publ. 33. *1–29. 9 pl.* 1924.—The topographic, climatic, economic, and forest conditions of the county are described. Suggestions are made for increasing the productivity of the forest land, which comprises about ½ the area.—*C. F. Korstian.*

8525. Bates, Carlos G., and Raphael Zon. **Research methods in the study of forest environment.** U. S. Dept. Agric. Dept. Bull. 1059. *1–209. 14 fig.* 1922.—This bulletin describes methods of measuring the climatic and edaphic factors of the environment, with special reference to forest problems. It suggests definite standards which should be attained and physiological principles which should be recognized. Because the methods and equipment for meteorological study are well-known and standardized, more attention is given to soils. Some original results obtained at the Fremont Forest Exp. Sta. (Colorado) are introduced in the discussion of water-holding capacity, available soil moisture, and its relation to the osmotic pull of the plant. The best methods of measuring solar radiation are still very much in doubt. The authors favor measurement of total radiation above and below the forest canopy, rather than partial measurements of photochemical processes. An appendix gives a previously unpublished psychrometric table for pressure 21.42 inches, applicable at an elevation of about 9,000 feet, and a bibliography of 169 titles.—*Authors.*

8526. Bates, Charles Z. **Introducción de arboles exoticos. [Introduction of exotic trees.]** Rev. Agric. Puerto Rico **14**: 305–307. 1925.—Exotic trees, seedlings of which are available for distribution by the Porto Rico Forest Service, are briefly described.—*John A. Stevenson.*

8527. Bates, Charles Z. **Lo que la silvicultura puede hacer por Puerto Rico. [What silviculture can do for Porto Rico.]** Rev. Agric. Puerto Rico **14**: 97–101. *2 fig.* 1925.

8528. Beeson, C. F. C. **Notes on the biology of the Brenthidae.** Indian Forest Rec. $\mathbf{11^4}$: 171–188. *Pl. 3.* 1925.—This is an account of the importance of these beetles to forest trees in India.—*E. N. Munns.*

8529. Beeson, C. F. C. **The teak canker-grub (Dihammus cervinus).** Indian Forest. **51**: 187–192. *Pl. 13.* 1925.—The habits of the canker grub on *Tectona grandis* are described and measures of control suggested, including: (1) slitting the bark-tunnels in the early stages of larval development; (2) applying tar or creosote to the stem in early May; and (3) wrapping the stem with a barrier of grass.—*E. N. Munns.*

8530. Belyea, Harold Cahill. **Current annual increment of red spruce and balsam fir in the Western Adirondacks.** Jour. Forest. **20**: 603–605. 1922.—The tables give current annual increment in percentages, and in cords and cu. feet, for red spruce and balsam fir in eastern St. Lawrence County, New York. Certain conclusions are drawn from the tables. —*Philip C. Wakeley.*

8531. Berger, L. G. den. **Causerie over wildhout. [A short lecture about East Indian woods.]** Tectona **17**: 1120–1129. 1924.—Teak is most widely used. In this lecture the other important kinds are compared with teak and it is shown that in most cases they can be substituted for it. There are many other kinds that are suitable for special purposes. For instance, *Celtis Wightii* Planch. is an excellent substitute for hickory.—*Charles Coster.*

8532. Boone, Andrew R. **Fighting the forest insect enemy.** Timberman 26^7: 58, 60. *8 fig.* 1925.

8533. Bornemann. **Über neue Untersuchungen zum Kohlensäureproblem. [Recent investigations on the carbon dioxide problem.]** Zeitschr. Forst- u. Jagdw. **55**: 704–708. 1923. —One of the chief problems of the forester is to provide the most favorable conditions for assimilation for his trees. The results obtained in Hohenlübbichow, Bärenthoren and elsewhere are due to better conditions of assimilation in these stands. The production of long slender shoots by young plants in seed beds is not the result of mutual crowding and striving toward the light, but is caused by shortage of available carbon. The carbon held in suppressed trees and seedlings in crowded stands is lost to the growing trees. The amount of carbon available through the air and soil is not unlimited but occurs as a definite quantity per unit of area. Frequent and timely thinnings serve to regulate the amount of CO_2 available. There is no reason why soil cultivation, which serves to make CO_2 more available as an agricultural plant food, can not be applied to forest crops to secure higher yields. (See also this issue, Entries 8443 and 8470.)—*J. Roeser.*

8534. Bourguet. **Le verglas de 1923 dans la région de Belfort. [The ice storm of 1923 in the region of Belfort.]** Bull. Trimest. Soc. Forest. Franche Comté et des Provinces de l'Est **16:** 6–12. 1925.—An ice storm on November 25–30, 1923, did much damage. Trees of all sizes were broken, uprooted, or stripped of their branches. Of the smaller coppice trees, 30% were destroyed, 10% of the small standards, and more in the coppice under 7 years old. More than ¼ of the trees over 60 cm. in circumference on 8,660 ha. were stripped of their branches.—*J. Kittredge, Jr.*

8535. British Honduras Government. **British Honduras.** *47 p. Illus. 1 map.* West India Committee: London, 1924.—A general description of the Colony is followed by brief accounts of its agriculture and important forest products.—*W. N. Sparhawk.*

8536. Britton, N. L. **El plantel del servicio forestal de Puerto Rico. [The Porto Rican forest service nursery.]** Rev. Agric. Puerto Rico **14:** 83–84. 1925.

8537. B[rown], R. M. [Rev. of: Howard, S. H. **Code for the collection and tabulation of statistical data.** *1 + 22 p. Pl. 1, 5 fig.* Superintendent Govt. Printing: Calcutta, 1921.] Jour. Forest. **20:** 650. 1922.—The publication gives in detail the procedure to be followed, in both the field and office, in the measurement of permanent and temporary sample plots, stem and stump analyses, measurements of volumes and form factors of typical trees, etc. A separately bound appendix contains samples of the various forms used for sample plot records.—*Philip C. Wakeley.*

8538. Bruner, E. Murray. **A comprehensive plan for the marketing and utilization of the remaining stand of chestnut necessitated by the chestnut blight situation.** North Carolina Geol. and Econ. Surv. Forestry Div. Economic Paper 56. *18–23.* 1925.

8539. Bruner, E. Murray. **El problema de la restauracion forestal de Puerto Rico. [The reforestation problem in Porto Rico.]** Rev. Agric. Puerto Rico **10^3:** 15–21, **10^4:** 19–26, **10^5:** 15–30. 1923.—Porto Rico was originally heavily wooded, but was rapidly denuded by the Spaniards, and the devastation continued during the early years of the American regime. The 1st step in reforestation was the establishment of the Luquillo National Forest in 1903. It was not put under management until 1917 when an Insular Forest Service was established in cooperation with the Federal Service. The forest nursery at Rio Piedras produces seedlings for planting on the public forests and for distribution to individuals. Many native and exotic trees have been grown, including *Casuarina* spp., *Swietenia, Cedrela, Prosopis, Colubrina, Acacia* and *Calophyllum.* The author discusses the climate, physiography and land utilization of Porto Rico in relation to the forestry problem.—*John A. Stevenson.*

8540. Brush, Virgil D. **Condición de las plantaciones forestales en los bosques insulares de Maricao y Guanica. [Condition of forest plantations in the Maricao and Guanica Insular forests.]** Rev. Agric. Puerto Rico **14:** 88–96. *3 fig.* 1925.—Plantings of *Petitia domingensis, Casuarina cunninghamiana, Piptadenia peregrina, Swietenia Candollei, Lucuma multiflora* and *Sideroxylon foetidissimum* were for the most part growing satisfactorily in the Maricao forest. Under the dry conditions prevailing at Guanica *Prosopis juliflora* and *Casuarina equisetifolia* were successfully employed. *Cedrela* did well only in low, moist situations. —*John A. Stevenson.*

8541. Brush, Virgil D. **Progreso y desenvolvimiento del plantel del servicio forestal insular. [Progress and development of the Insular Forest Service Nursery.]** Rev. Agric. Puerto Rico **14:** 113–131. *8 pl.* 1925.—The production of tree seedlings increased from about 40,000 in 1921–1922 to nearly 400,000 in 1924. A large number of native and exotic species have been grown and tested under varying conditions.—*John A. Stevenson.*

8542. Burger, Hans. **Der Plenterwald, der gemischte Wald, und die Stammformen der Laubhölzer. [Selection forest, mixed forest, and stem form of broad-leaved trees.]** Forstwiss. Centralbl. **47**: 281–286. 1925.—All-aged mixtures of conifers and broad-leaved trees are best where the main crop is fir or spruce; where it consists of less tolerant conifers, such as pine or larch, all-aged stands are less satisfactory, and the secondary species should be broad-leaved trees, never fir or spruce. Where production of high-grade hardwoods is the object, conifers should not be introduced, as they tend to distort the boles of the hardwoods; even-aged stands, or stands composed of even-aged groups, produce straighter boles than uneven-aged. These differences are due to the different heliotropic and geotropic responses of the tolerant and intolerant conifers and of broad-leaved trees. Fir and spruce, according to Engler, respond only to geotropic influences, while pine and larch probably also make heliotropic movements, and broad-leaved trees are especially susceptible to heliotropic stimuli.—*W. N. Sparhawk.*

8543. Busse. [Rev. of: Nakashima, Hirokichi. **Über den Einfluss meteorologischer Faktoren auf den Baumzuwachs. [Influence of meteorological factors on tree growth.]** Jour. Coll. Agric. Hokkaido Imp. Univ. **12**^{2}: 69–263. 1924.] Deutsch. Forstzeitg. **40**: 526–528. 1925.—The study was based on 5 years' measurements with a Friedrichs dendrograph, of the changes in circumference of a 50 year-old *Abies mayriana.* From December to February, increase or decrease in circumference showed fairly close correlation with temperature, and from May to September, with precipitation. (See also Bot. Absts. 14, Entry 7031.)—*W. N. Sparhawk.*

8544. Buttrick, P. L. **Storm damage to Michigan forests.** Jour. Forest. **20**: 527–532. 1922.—In February, 1922, an ice storm covering some 14,000 square miles in a zone 80–100 miles wide from Saginaw Bay to Lake Michigan broke many trees. Species with brittle wood, like the poplars, suffered most; conifers suffered least.—*Philip C. Wakeley.*

8545. Buttrick, P. L., E. H. Frothingham, G. F. Gravatt, and E. Murray Bruner. **Chestnut and the chestnut blight in North Carolina.** North Carolina Geol. and Economic Surv. Economic Paper [Raleigh] 56. *1–24.* 1925.—This paper discusses the range, yield, value and present stand of chestnut; the chestnut blight (*Endothia parasitica*); and a comprehensive plan for marketing and utilizing the remaining stand of chestnut, necessitated by the spread of the blight.—*C. F. Korstian.*

8546. C., B. E. [Rev. of: Söderlund, Nils L. **Om beräkningen av Konstanterna i Höyers Stamkurve-ekvation. (The calculation of constants in Höyers' tree form equation.)** Skögsvårdsför. Tidskr. **1918**: 636–640. 1918.] Jour. Forest. 20: 640–642. 1922.—The article reviewed gives a more simple method of determining the constant C, in Höyers' tree form formula, than the method outlined by H. H. Chapman.—*Philip C. Wakeley.*

8547. Carter, E. E. [Comment on: Hanzlik, E. J. **Determination of the annual cut on a sustained basis for virgin American forests.** Jour. Forest. **20**: 611–625. 1922.] Jour. Forest. **20**: 626. 1922.—Hanzlik's method does not allow for the probable loss in volume in mature Douglas fir forests, or for the difficulty of establishing a logging operation unless a heavy cut is allowed at the start.—*Philip C. Wakeley.*

8548. Chapman, H. H. **Application of yield tables in the measurement of growth on large areas.** Jour. Forest. **20**: 581–586. 1922.—The author sets forth in detail the principles governing the use of yield tables, including the prediction of yield of uneven-aged stands. The difficulties of constructing tables for even-aged mixed stands are over-drawn. The factor of density presents an urgent problem; empirical tables based on direct averages of stands of different densities are worthless. Index or normal tables, giving attainable yields based on stands with complete crown canopies should be used. Site classification may best be based on the heights of dominant trees of key species at specified ages. "No growth data of any real value for long term forestry can be obtained on any other basis than area, age, and volume in the present condition of our forest areas. Growth per cent is a poor substitute and most inaccurately applied and conducive to gross errors."—*Philip C. Wakeley.*

8549. Chittenden, A[lfred] K. **Christmas tree plantations.** Michigan Agric. Exp. Sta. Special Bull. 145. *1–9. 3 fig.* 1925.—The growing of Norway spruce (*Picea excelsa*) for Christmas trees is described.—*W. N. Sparhawk.*

8550. Cieslar, [Adolf]. **Die Produktionssteigerung der schweizerischen Forstwirtschaft. [Increasing production of Swiss forestry.]** [Rev. of: Hefti, P. **Die Produktionssteigerung der schweizerischen Forstwirtschaft eine nationale Pflicht.** Schweizerischen Forstverein: Bern, 1920.] Centralbl. Gesam. Forstw. **47**: 161–169. 1921.—In Switzerland, the State and communal forests managed by trained foresters yield annually 4.28 and 4.30 cu. m. of wood to the ha., against only 2.61 cu. m. for communal forests that are not so managed, and the net money yield is 50% greater. The yield can be increased by providing adequate means of transportation, thus making more complete utilization possible, and by increasing the growth through silvicultural measures. This involves growing mixed, uneven aged stands and elimination of clear cutting.—*W. N. Sparhawk.*

8551. D., G. **Analyse economique d'un domaine forestier. [Economic analysis of a forest property.]** Bull. Soc. Centrale Forest. Belgique **30**: 317–321. 1923.—This is a résumé of an article in Quart. Jour. Forest. **17**: 12–25, 1923, describing the management of a forest property in southern England. The net revenue in 1922 amounted to 1.5% of the capital value. The authors, W. E. Hiley and A. Milne, conclude that Douglas fir plantations should be managed on a 25-year rotation, producing a revenue of 9%; larch on the same rotation, producing 7%; and spruce on a 40-year rotation, to produce 6%. Charcoal operations conveniently located will absorb the small wood. The new management will employ 1 man to each 100 acres.—*H. T. Gisborne.*

8552. DeSmidt, W. J. **Studies of the distribution and volume of the wood rays in slippery elm. (Ulmus fulva Michx.)** Jour. Forest. **20**: 352–362. 1922.—The article gives results of a photomicrographic study of the rays in 3 trees. Samples of wood taken at intervals throughout the trunks, and from the root of the largest tree, were examined in tangential section. Uniseriate rays varied little in volume throughout; multiseriate rays varied much in both number and volume, being smallest and most numerous in the upper crown, largest and least numerous at the stem base, and both large and numerous in the root. The 3 regions mentioned are centers of maximum ray volume. Five references are cited.—*Philip C. Wakeley.*

8553. Dombois. **Ist die Harznutzung in hochwertigen Kiefernbeständen aus forstwirtschaftlichen Gesichtspunkten zu rechtfertigen? [Is resin extraction from valuable pine stands justifiable from the forestry standpoint?]** Deutsch. Forstzeitg. **40**: 711–713. 1925.—In eastern Prussia, the financial loss resulting from degrading the lumber cut from high grade trees (*Pinus silvestris*) that have been bled for resin greatly outweighs the income from the resin.—*W. N. Sparhawk.*

8554. Domes, Norbert. **Der erste österreichische Almwirtschaftstag in Salzburg. [The first Austrian range management meeting in Salzburg.]** Centralbl. Gesam. Forstw. **47**: 56–63. 1925.—This meeting was held in November, 1920, for the purpose of organizing an association of the grazing industry. The importance of the industry and its relation to forestry and other branches of agriculture were discussed. Mountain pastures occupy 1,276,000 ha., or 15.4% of the area of Austria. While pasture and forest areas should generally be distinct, it was pointed out that sheep and cattle in many cases aid natural reforestation and that grazing does no harm in old, open stands.—*W. N. Sparhawk.*

8555. Drane, Brent S. **Biennial report of the State Geologist and Director.** North Carolina Geol. and Economic Surv. Bienn. Rept. **1923–1924**. (Dec. 1, 1922 to June 30, 1924.) *65 p.* 1925.—The report of the Forestry Division is summarized on pages 22–35. Forest fire statistics, fire protection, and State forests and parks are discussed.—*C. F. Korstian.*

8556. Dunning, Duncan. **Relation of crown size and character to rate of growth and response to cutting in western yellow pine.** Jour. Forest. **20**: 379–389. 1922.—Studies on the Shasta, Plumas, Tahoe, and Sierra National Forests (California) show that present crown classes (dominant, codominant, etc.) in all-aged or mixed stands do not represent vigor classes. Trees with large crowns, or with dense, dark foliage, pointed tops, and dark, rough bark grow more rapidly than trees of similar size and crown class but lacking these characteristics. Trees with large, pointed crowns respond more promptly to release than trees with small, badly-formed crowns; trees which have grown slowly may show a greater relative response, but seldom make an absolute growth equal to those of more vigorous appearance. —*Philip C. Wakeley.*

8557. Durland, W. D. **El desarrollo de la silvicultura. [The development of silviculture.]** Rev. Agric. Puerto Rico **13**: 335–339. 1924.—This is a brief résumé of the development of silviculture and its present status in Europe and America.—*John A. Stevenson.*

8558. Eckstein. **Mäusebekämpfung. [Combatting mice.]** Deutsch. Forstzeitg. **40**: 545. 1925.—Several species of field mice cause serious injury to young forest plantations by gnawing the bark during the winter. Grain soaked in strychnine solution and placed in hollow tiles under brush-heaps (to avoid poisoning pheasants, etc.) is effective in destroying the mice. The grain should be hulled before poisoning.—*W. N. Sparhawk.*

8559. Eidmann, H. **Beobachtungen an parasitierten Kiefernspannerpuppen. Ein Beitrag zur Frage nach der Hebung des eisernen Parasitenbestandes. [Observations on parasitized pupae of the pine moth. The problem of maintaining a stable supply of parasites.]** Forstwiss. Centralbl. **47**: 357–369. *Fig. 1–7.* 1925.—Besides climatic conditions, nature of the soil, and altitude, which man cannot modify, the principal factors in outbreaks of disastrous forest insect epidemics are to be sought in the composition and structure of the forest itself, which can be modified. A disturbance of the natural balance between harmful insects and their parasites, especially Ichneumonidae and Tachinidae, usually results in serious damage to the forest. Yano has shown that the proportion of parasites is much greater in mixed than in pure stands, probably because the parasitic species, having a shorter life cycle than 1 host, require alternate hosts; these host insects are more likely to be present in forests with a variety of tree species.—The author shows how to distinguish healthy from parasitized pupae of the pine moth. Investigations to ascertain the relative abundance of parasites should be made right after the snow melts, as they emerge from the moth pupae several weeks earlier than the moths normally emerge.—*W. N. Sparhawk.*

8560. Endert, F. H. **Boschbouwkundige aanteekeningen over een reis in Atjeh, Sumatra's Oostkust, Tapanoeli en Sumatra's Westkust. Korte mededeeling van het proefstation voor het boschwezen No. 9. [Sylvicultural notes on a trip through Atjeh, East coast of Sumatra, Tapanoeli, and West coast of Sumatra.]** (Summary in English.) Tectona **18**: 1–160. *Map.* 1925.—For each area visited a description of the forests is given, the more important species being treated in some detail. For the named plants, there are extensive indexes of vernacular and scientific names. Many plant genera of Sumatra have no Javanese representatives. The Sumatra flora is more like that of Malacca and Borneo than that of Java. The differences with Java increase as one goes from the south of Sumatra to the north. These differences are most pronounced in the forests of the plains and the undulating country. The tidal forests all over the archipelago are fairly uniform. Large areas with moist soil are covered with inferior forests. The forests on dry soil of tertiary and older origin are better, owing to the greater abundance of Dipterocarps, which supply most of the timber used in Sumatra.—The mountain-forests are more like those of Java than the other types. The principal trees are *Quercus*, *Castanea*, Theaceae, Lauraceae, and *Altingia excelsa* Noronh. From south to north the number of Lauraceae diminishes, while the Myrtaceae and Sapotaceae largely increase.—*Charles Coster.*

8561. Fenska, R. R. **Yield table for white pine.** Jour. Forest. **20**: 593–597. 1922.—The yield table is based on 16 New England plantations from 27 to 63 years old. It indicates that a white pine plantation on Site II in New England yields the maximum volume of timber in 60–65 years, and that with present stumpage prices and taxes it will yield at least 5% compound interest on the investment in 50 years.—*Philip C. Wakeley.*

8562. F[ernow], B. E. [Rev. of: Hosmer, Ralph S. **Impressions of European forestry.** *80 p. Illus.* Lumber World Review: Chicago, 1922.] Jour. Forest. **20**: 649–650. 1922.—The author has produced "a useful as well as readable account of conditions" of forestry in Great Britain, the 3 Scandinavian States, France, Switzerland, and parts of Germany.—*Philip C. Wakeley.*

8563. Fischer, C. **Anbau fremdländischer Holzarten im Revier Weissenthurm, Oberforsterei Rüdesheim. [Cultivation of exotic trees in the Weissenthurm forest.]** Deutsch. Forstzeitg. **40**: 713–714. 1925.—This consists of notes on the behavior of small plantations made in Hesse-Nassau between 1900 and 1910. The following species were tested: *Pinus strobus, P. rigida, Pseudotsuga taxifolia, Chamaecyparis lawsoniana, Cryptomeria japonica, Larix leptolepis, Picea canadensis, P. sitchensis, P. pungens, Abies balsamea, A. concolor, A.*

grandis, *A. nordmanniana*, *A. excelsa viridis*, *Sorbus domestica*, and *S. terminalis*.—*W. N. Sparhawk.*

8564. Fisher, R. T. **Note on the measurement of growth for large regions.** Jour. Forest. 20: 586–588. 1922.—Directions are given for determining the areas of forest classes, preparatory to applying index yield tables over large areas.—*Philip C. Wakeley.*

8565. Gardner, C. A. **The forest formations of Western Australia: VII. The tingle tingle forest.** Australian Forest. Jour. 8: 4–6. 1925.—This forest is characterized by red tingle tingle (*Eucalyptus Jacksoni*) and yellow tingle tingle (*E. Guilfoylei*), together with other less characteristic species. Its distribution and composition are discussed.—*C. F. Korstian.*

8566. Gardner, C. A. **The forest formations of Western Australia: VIII. The Kimberley sclerophyllous woodlands.** Australian Forest. Jour. 8: 72–75. *2 fig.* 1925.—This formation is characterized by messmate (*Eucalyptus tetrodonta*), ironbark (*E. terminalis*) and *E. miniata* The "fan palm" (*Livistona Eastoni*) is a sub-dominant associate. Other smaller species are *Acacia tumida*, *Grevillea heliosperma*, *Persoonia falcata*, and *Acacia holosericea*. This type is of minor importance for forestry purposes.—*C. F. Korstian.*

8567. Geete, Erik. **Några iakttagelser från lemmelåret 1923: tillägg. [Some observations from the lemming year 1923. Supplement.]** Skogen 12: 175–176. 1925.—Comments and additional observations by other writers support the theory that lemmings benefit the forest, especially by causing aeration of the surface soil. (See Bot. Absts. 14, Entry 7060.)—*Henry I. Baldwin.*

8568. Gerlings, J. H. Jager, en E. Hesselink. **De "Dauerwaldwirtschaft" op het landgoed Bärenthoren in Anhalt en de beteekenis er van voor den Nederlandschen boschbouw. [Shelterwood system on the estate of Bärenthoren in Anhalt and its adoption for Holland.]** (With English and German summaries.) Mededeel. Rijksboschbouwproefsta. **1**^{1}: 105–125. *Pl. 13–14.* 1922.—The cutting system is characterized by abolition of clear felling, raking of leaf mould, lopping brush, careful thinning for growth and for selected trees, natural regeneration under shelterwood, and cutting at silvicultural maturity. Thinning begins at 20 years and continues as needed, the aim being to get loose and free tops on particular trees selected for growth. Natural regeneration takes place over 20 years, and about 20 trees to an acre are left as standards. Yields are much higher than with pure pine stands grown on short rotations following clear cutting, which impoverishes the soil. The litter and slash rot rapidly and create favorable humus conditions.—*E. N. Munns.*

8569. Geschwind, A. **Die Bedeutung des Zwergwacholders (Juniperus nana Willd.) für den Gebirgswald. [The importance of the dwarf juniper in mountain forests.]** Centralbl. Gesam. Forstw. **47**: 139–142. 1921.—Dwarf juniper, which covers large areas in the higher parts of the mountains of Bosnia and Herzegovina, is a valuable soil cover on steep, dry, untimbered sites, especially on limestone formations. In some places, however, it is a serious hindrance to natural reproduction of forest trees, and also gradually encroaches on the edge of the forest. By keeping air and moisture from their roots it causes the trees to become stag-headed and eventually to die.—*W. N. Sparhawk.*

8570. Geschwind, A. **Ein Beitrag zur Biologie der Panzer- oder weissrindigen Kiefer (Pinus leucodermis Ant.). [A contribution on the biology of whitebarked pine.]** Centralbl. Gesam. Forstw. **47**: 30–41. 1921.—This pine occurs only on a few mountains of the Karst region in the western portion of the Balkan peninsula. It forms pure open stands between 1200 and 1600 m. altitude; from 800 to 1200 m. it is mixed with beech and *P. austriaca*, and from 1600 to 2000 m., with *P. montana*. It bears seed early and abundantly, and seed years are frequent, averaging once in 3 years at 60–80 years of age. The seed are disseminated chiefly by the "bora," a cold, dry, northeast wind that blows for several weeks in September and October. The seed germinate best on bare mineral soil that has been stirred up by the hoofs of grazing animals, or in pockets between rocks. Being very intolerant from the beginning, seedlings can survive only in full light. The stems are usually crooked, the result of snow pressure or phototropic bending. The root system is wide-spreading, thickly branched, and provided with numerous vertical anchor roots instead of a tap root, hence the tree is exceedingly windfirm. The stems are frequently injured by rolling stones. The tips of the branches sometimes die back in times of extreme drought, while the lower twigs are occasionally killed by *Herpotrichia nigra*, which is common on *Juniperus nana* in the locality.

When the main stem is cut, 1 or more of the bottom branches usually takes its place, and adventitious sprouts are not unusual. The slight shelter and light humus afforded by the pine enable various forage plants to grow, thus improving the alpine pastures. In mixture with an understory of beech, the tree forms a pyramidal crown and reaches a height of 30 m., double its height in pure stands.—*W. N. Sparhawk.*

8571. Goethart, J. W. C., P. Tesch, E. Hesselink, en M. D. Dijt. **Cultuur en waterleidingbelangen. Uittreksel uit het rapport inzake het verband tusschen wateronttrekking en plantengroei. [The relation between the vegetation and the withdrawal of water.]** (With French summary.) Mededeel. Rijksboschbouwproefsta. 1^3: 5–28. *1 fig.* 1924.—The effect of lowering the subterranean (phreatic) water level by the construction of aqueducts was investigated in the Dutch sand dune region. Native vegetation originally more than 70 cm. above the water level (dune slopes and ridges) was not affected, consequently there was little sand movement. Vegetation which originally stood less than 70 cm. above the soil water (dune valleys) underwent considerable modification. Lands with water 50–80 cm. below the surface are suitable for cultivation, and those with water at 30–50 cm. make good pastures; hence lowering the water level to 30 cm. and 50 cm. rendered the dune valleys useless for pasture and for cultivation, respectively. Lowering below those levels had no further effect. Lowering the ground water level retarded the growth of 40–70 year-old pines where the water was within 3 m. of the surface, but did not cause them to die. For most of the forest land in the dune region the water lies deeper, and further lowering can have no effect.—*W. N. Sparhawk.*

8572. Goethe, K. **Unsere Holzversorgung und Forstwirtschaft. [Our wood supply and forestry.]** Oesterreich. Vierteljahresschr. Forstw. 42: 1–19. 1924.—The need of forest conservation in Austria is discussed and methods are suggested for securing higher yields. —*K. W. Woodward.*

8573. Gonggrijp, J. W. **Over de winning van hars en terpentyn uit pijnboomen. [The extraction of resin and turpentine from pine trees.]** Mededeel. Proefsta. Boschw. 10. *1–57. 17 fig.* 1924.—The methods of extracting resin in France, America, Germany and British-India are described, with statistics on the trade, prices, and current measures and weights. An extensive list of literature is cited.—*Charles Coster.*

8574. Gonggrijp, J. W. **Resultaten van een plaatselijk onderzoek in de Pinus Merkusii bosschen der Gajoe landen. [Results of a local investigation of the Pinus Merkusii forests of the Gajoe lands.]** Mededeel. Proefsta. Boschw. 10. *57–87. 15 fig.* 1924.—The Gajoe lands in North Sumatra contain considerable areas of *Pinus Merkusii* Jungh & de Vr. which is suitable for resin and turpentine extraction. A preliminary investigation showed that the resin-ducts have no communication in a tangential direction, but only vertically and radially, so that the streak for tapping must be as broad (tangentially) as possible. Shallow streaks (1 cm. and less) gave as good results as those 3–4 cm. deep.—The rate of growth and the regeneration of the pine are discussed. Fire protection alone will not bring about satisfactory regeneration, because the pine can sow itself only on uncovered soil.—*Charles Coster.*

8575. Goudie, H. A. **The remarkable pine: Pinus radiata in New Zealand.** Australian Forest. Jour. 8: 22–27. 1925.—The silvical characteristics, the very rapid growth rate, the establishment of plantations, and the yields of *Pinus radiata* in New Zealand are discussed. —*C. F. Korstian.*

8576. Graham, S. A. **Some entomological aspects of the slash disposal problem.** Jour. Forest. 20: 437–447. 1922.—Studies of burned and unburned slash of *Pinus divaricata, P. resinosa, P. strobus, Abies balsamea.*, and *Picea mariana* in Itasca Park, Minnesota, indicate that in northeastern forests piling with the larger pieces underneath, near the ground, is, from the standpoint of insect control, more effective than burning. Burning seldom chars the bark of larger limbs and stumps enough to prevent the breeding of such dangerous insects as *Ips pini* Say, while piling small slash, in which no harmful insects breed, on the larger pieces keeps them moist enough so that only harmless or even beneficial insects breed in them. Stumps should always be covered when possible. Many insects materially hasten the disintegration of slash.—*Philip C. Wakeley.*

8577. Gray, H. R. **Farming and forestry.** Jour. Dept. Agric. Western Australia 2nd Ser. 1: 460–467. *4 fig.* 1924.—This paper consists, for the most part, of a general discussion of the value of forests. Some suggestions and directions are given as to the kind of trees to plant in various areas and upon various soil types.—*P. J. Olson.*

8578. Great Britain Forestry Commission. **Forestry in Great Britain.** (Statement prepared by the Forestry Commission for the British Empire Forestry Conference. Ottawa: July, 1923.) *21 p.* Harrison & Sons, Ltd.: London, 1923.—During the 3 years ending Sept. 30, 1922, the Commission acquired 22,886 acres by purchase and 69,540 acres by lease, and planted 17,918 acres with conifers and 569 acres with broad-leaved trees. In addition, the State paid for planting 10,192 acres belonging to corporate bodies and individuals, under the unemployment laws, and above 20,000 acres were planted by private owners. The nursery business is so well organized that the Commission does not distribute planting stock to private owners.—Research includes studies of growth, yield, thinnings, nursery and plantation practice, forest management, forest insects, forest pathology (especially *Phomopsis Douglasii*), growth of trees on peat soils, and ecological studies to correlate vegetation, soil condition, and potential utilization for forestry.—Detailed statistics of exports and imports of unmanufactured and manufactured forest products in 1922 are given. The net annual growth is estimated at 37,476,000 cu. feet; the cut, 32,000,000 cu. feet; and the total consumption (not including manufactured products) 349,840,000 cu. feet of timber and 923,000 tons of wood pulp, or 11.3 cu. feet per capita, which is less than before the war.—*W. N. Sparhawk.*

8579. Greeley, William B. **Economic aspects of forestry.** Jour. Land & Public Utility Economics **1**: 129–137. 1925.

8580. Gretsch. **An den badischen Forstverein. [To the forestry association of Baden.]** Forstwiss. Centralbl. **47**: 298–314. 1925.—It is pointed out that forest management based on silvicultural principles is better in the long run from the public viewpoint, even though it may be temporarily less profitable from the viewpoint of private economics than management based on the theory of getting the highest possible rate of return. Some form of continuous forest with mixed stands and natural reproduction is usually preferable to any form of clear cutting, and a fairly large growing stock should always be maintained in order to insure a high rate of production. The decrease in productivity of Saxon forests is the result of letting financial considerations alone govern their management.—*W. N. Sparhawk.*

8581. Grieve, J. C. **Our earthen tanks.** Australian Forest. Jour. **8**: 40–45. 1925.—This article briefly describes the relation between forested soils and stream flow of the Upper Murray River, and the effect of forest fires.—*C. F. Korstian.*

8582. Guise, C. H. **The rate of interest as a factor in the cost of growing timber.** Jour. Forest. **20**: 589–592. 1922.

8583. G[uise], C. H. [Rev. of: Winkenwerder, Hugo, and Elias T. Clark. **Handbook of field and office problems in forest mensuration.** *2nd ed. 133 p.* J. Wiley & Sons: New York, 1922.] Jour. Forest. 20: 646–649. 1922. [See also Bot. Absts. 12, Entry 6293.]

8584. Guthrie, John D. **Alaska's interior forests.** Jour. Forest. **20**: 363–373. 1922.—Alaska's interior forests are estimated to cover some 150,000,000 acres, practically all within the Yukon and Kuskokwim Basins. The principal tree species are *Picea canadensis, Betula alaskana, Populus balsamifera, Populus trichocarpa, Populus tremuloides, Picea mariana,* and *Larix alaskensis,* of which the 1st is most important. Tree growth compares favorably with that of northern Maine and eastern Canada. The chief use of wood is for fuel; the local supply must also serve the future development of mining and agriculture. Export of forest products, even of pulp, is improbable. Artificial reforestation seems entirely impracticable. The forests are on unreserved public land and have received no fire protection.—*Philip C. Wakeley.*

8585. Guthrie, John D. **Notes on the forests of Rumania.** Jour. Forest. **20**: 513–520. 1922.—About 40% of the surface of Rumania is forested. Transylvania is the most important forest region. The Transylvanian Alps are wooded to more than 5,000 feet, with *Fagus sylvatica* and some oak (*Quercus pedunculata* and *Q. sessiliflora*) on the lower slopes and *Picea excelsa, Abies pectinata, Pinus laricio, P. sylvestris* and *Larix europea* higher up. Prior to the war private owners held 54% of the forest, the rest belonging to the Government, Crown, communes, or institutions. Before 1885 exploitation was unregulated; since then, forestry has developed considerably, largely after the French model.—*Philip C. Wakeley.*

8586. HANZLIK, E. J. **Determination of the annual cut on a sustained basis for virgin American forests.** Jour. Forest. **20:** 611–625. 1922.—National forest timber sale plans are based upon a limitation of the annual cut for individual forests, roughly according to Von Mantel's method. Management plans for individual working circles are now required. The author advocates that the allowed annual cut, especially in the Douglas fir of western Washington and Oregon, be determined by the formula $Y = \frac{Vm}{r} + I$ or its modification $Y = \frac{Vm}{r} + I + \frac{Vm - Vn}{x}$. Vm is the volume of merchantable, mature timber above rotation age. The method calls for yield tables applicable for the region. Examples supplement the article.—*Philip C. Wakeley.*

8587. HARRER. [Rev. of: MERRILL, PERRY H., AND RALPH C. HAWLEY. **Hemlock: its place in the silviculture of the southern New England forest.** Yale Univ. Forest. School Bull. **12:** 1–68. *9 fig.* 1924. (see Bot. Absts. 14, Entry 4257).] Forstwiss. Centralbl. **47:** 354–355, 1925.—The review suggests more extensive cultivation of *Tsuga canadensis* in Germany, although he considers *T. heterophylla* better for most sites.—*W. N. Sparhawk.*

8588. HÄRTEL, OTTOKAR. **Die Bedeutung des Waldes für die Wildbach- und Lawinenverbauung. [Importance of forests in the control of torrents and avalanches.]** Centralbl. Gesam. Forstw. **47:** 129–138. 1921.

8589. HÄRTMANN, F. K. **Die Bestandesbodenflora als Ausdruck der Gesamtwirkung aller Standortsfaktoren. [The flora of the forest floor as an expression of the combined action of all site factors.]** Zeitschr. Forst- u. Jagdw. **55:** 609–632. 1923.—As the ground flora reflects fluctuations in site conditions considerable attention should be given to it in planning silvicultural operations. This paper describes studies of the ground cover on 20 plots in pure oak stands in the city forest of Giessen, in Brunswick, and in the Dillenburg forest, Prussia.—*J. Roeser.*

8590. HAUCH, L. A. **Indblanding af andre Løvtraeer i Bøgeskoven. [Mixture of other hardwoods in the beech forest.]** Dansk Skovfor. Tidsskr. **10:** 80–97. *1 fig.* 1925.—The increase in soil acidity resulting from continuous maintainance of dense beech stands seems to indicate that a rotation of crops might be desirable. Unless this is done, the number of stems decreases, and the stand becomes more open. In deciding upon suitable mixtures, local temperature relations must be considered. The time of invasion of several hardwood species into Denmark is discussed.—*W. H. Meyer.*

8591. HAWLEY, RALPH C. **The continuous forest—a review of certain articles appearing in German forestry journals, 1920–1922.** Jour. Forest. **20:** 651–661. 1922.—These articles deal with a more or less new method of treatment ("Dauerwaldwirtschaft"), especially as applied to some 1,600 acres of Scotch pine at Bärenthoren, southwest of Berlin, Germany. The essentials of the system are avoidance of clear cutting, maintenance of forest conditions (by uninterrupted tending of soil and stand), use of natural regeneration, annual felling of selected individual trees, and getting the maximum rate of growth on the largest and most valuable growing stock. A fixed rotation is not considered, and the emphasis is on silviculture rather than on regulation. The method requires great personal skill on the part of the forester; 29 years of its use at Bärenthoren have shown its effectiveness on a Quality IV site for pine, with a 22 inch rainfall. The author comments on the relation of the method to possible American practice, and cites 8 references besides the 20 dealing directly with "Dauerwaldwirtschaft."—*Philip C. Wakeley.*

8592. [HAYAO, USHIMARO.] **Forestry of Japan.** *(1) + 69 p., 6 pl.* Bureau of Forestry: Tokyo, 1923.—Information is given on the extent, ownership, composition, and distribution of the forests; the stand of timber; the organization and functions of the forest administration; the management of public forests and policy regarding other forests; forestry education and research; the lumber and wood-using industries; and the timber trade.—*W. N. Sparhawk.*

8593. HESSELINK, E. **De Beeteekenis van het zaadvraagstuk voor onze grove dennenbosschen. [Importance of the source of seed for our pineries.]** (With German and French summaries. Mededeel. Rijksboschbouwproefsta. **1^1:** 10–102. *7 pl. 12 fig.* 1922.—Twelve year's experiments in growing *Pinus sylvestris* from seed collected in various European countries indicate that root development is a hereditary characteristic, and that there are definite relations between the color of seed, the character of growth of the seedling, and the parent. Seed, therefore, should be collected from carefully selected trees, and as far as practicable should be collected only in good seed years. Racial strains in various regions appear to have different colored seed, while in a given region seed are darker colored in years of abundant seed than in poor seed years.—*E. N. Munns.*

8594. Hesselink, E. **Eenige waarnemingen bij het drogen van grove dennenkegels in het seizoen 1923/24. [Notes on drying of pine cones, 1923–1924.]** (With German summary.) Mededeel. Rijksboschbouwproefsta. **1**^{3}: 29–37. *1 fig.* 1924.—Only 1% of cones collected from the northeast side of a stand failed to open, while 38% of those from the southwest side remained closed. Cones from the north side of trees opened sooner than those from the south side of the same trees, and the shady sides of single cones opened before the sides exposed to the sun. It is concluded that development in direct sunlight hinders cone opening, and that difficulty in seed extraction may follow an unusually hot summer. The seed from cones grown in the shade also germinated better than the other.—The green weight of cones collected in February was about the same as the dry weight of cones collected in October-November. Cones collected in October lost 42.6% in weight and 28.6% in volume by drying, yet there were fewer cones to the hectoliter late in the season. This is probably due to the fact that dry cones do not pack as closely as green.—*W. N. Sparhawk.*

8595. Hesselink, E. **Invloed van bergden op grove den. [Influence of Pinus montana on Pinus silvestris.]** (With German summary.) Mededeel. Rijksboschbouwproefsta. **1**^{3}: 38–46. 1924.—Planted on sand dunes in Holland, *P. silvestris* grew considerably better and fewer plants died where it was grown in mixture with *P. montana,* than in pure stands mixtures with *P. laricio austriaca.* The difference was noticeable for 1-year seedlings and also for 10 year-old plantations.—*W. N. Sparhawk.*

8596. Hilf, H. H., and J. Liese. **Zur Frage der Stubbenrodung auf Talsandböden. [The question of stump grubbing on sandy bottom soils.]** Zeitschr. Forst- u. Jagdw. **55**: 545–560. *Pl. 1–3.* 1923.—Observations of carefully grubbed and filled-in stump holes indicate that stump grubbing counteracts injurious soil cover and soil compaction, helps to retain the moisture, and acts beneficially by mixing humus and soil. Under these conditions root development and growth of young pines in old stump holes may be excellent. For Biesenthal and similar localities in the North German lowlands it is concluded that stump grubing not only provides fuel wood but also improves the soil and increases yields on previously uncared-for sandy bottom lands. The holes should be filled carefully, with humus in the upper layer, and should be restocked principally with hardwoods.—*J. Roeser.*

8597. Hoogh, J. de. **De groene Douglas (Pseudotsuga taxifolia) in Nederland. [Douglas fir in the Netherlands.]** Mededeel. Rijksboschbouwproefsta. **2**^{1}: 1–114. *7 pl. 10 fig.* 1924.—Douglas fir is widely planted in the Netherlands. Sample plots and measurements of individual trees in various parts of the country indicate that it yields twice as much wood as Scotch pine. As many plantations were poor because of inferior seed, locally-grown seed is recommended. The trees are injured by spring frosts and are heavily browsed by deer. The wood is as valuable as Scotch pine for all purposes tested. Spiral grain was frequent. Heart wood is formed early, comprising up to 30% of the stem at 24 years. The tree is apt to be shallow rooted, but maintains soil fertility. It reproduces readily by natural means at an early age.—*E. N. Munns.*

8598. Hopkins, Arthur S. **The forest fire hazard in the Adirondack and Catskill regions.** Jour. Forest. **20**: 629–632. *Fig. 1.* 1922.—The results, since 1903, of the New York State Conservation Commission's protection of 7,270,000 acres of forest land in the Catskills and and Adirondacks are summarized.—*Philip C. Wakeley.*

8599. Houard, A. R. **Tropical timbers.** [Rev. of: Record, Samuel J., and Clayton D. Mell. **Timbers of tropical America.** *xviii + 610 p. 50 pl.* Yale Univ. Press: New York; Oxford Univ. Press: London, 1924 (see Bot. Absts. 14, Entry 3380).] Nature **115**: 595–597. 1925.—Comment is made upon reforestation progress in various countries. Some errors and problems of identification are mentioned. (See also Bot. Absts. 14, Entry 7114.)—*O. A. Stevens.*

8600. Imperial Institute, Director. **Wattle bark from Ceylon.** Bull. Imp. Inst. **21**: 466–468. 1923.—Samples of bark of *Acacia dealbata, A. decurrens,* and *A. molissima* from

Ceylon contain 23%–33% tannin. They probably would be available for export to the United Kingdom to supplement the present supply, which comes mainly from Natal.—*L. A. Kenoyer.*

8601. Janka, G[abriel]. **Ueber die technische Qualität des Douglastannenholzes. [Technical quality of Douglas fir wood.]** Centralbl. Gesam. Forstw. **47:** 185–198. *Fig. 1.* 1921.—The wood of two 26–30 year-old Douglas fir trees grown in Austria was subjected to various mechanical tests, and the results were compared with those from native spruce and larch of similar specific gravity and moisture content. The detailed results of the tests are given. It is concluded that Douglas fir at 30 years yields timber much superior to that of spruce and larch of the same age. Since the strength of the wood increases as trees grow older it is believed that fir promises to occupy a prominent place in Austrian forestry.—*W. N. Sparhawk.*

8602. Janka [Gabriel]. [Rev. of: Abeles, Josef. **Handbuch der Technik des Weichholzhandels (Fichte und Tanne) mit besonderer Berücksichtigung des Sägebetriebes und der Produktion von Schnittmaterial. (Technical handbook of the softwood industry (spruce and fir) with special reference to the sawmill industry and the production of lumber.)** Paul Parey: Berlin, 1920.] Centralbl. Gesam. Forstw. **47:** 240–242. 1921.

8603. Jonson, Tor. **Riksskogstaxeringen. Några preliminära resultat från Småland och Dalarna. [The national forest survey: some preliminary results from Småland and Dalecarlia.]** Skogen **12:** 105–110. 1925.—Differences of 15–20% from the official statistics for forest area were discovered, caused in many cases, by changes in classifying forest types. —*Henry I. Baldwin.*

8604. Joubert. **Mise en exploitation des forêts domaniales du nord de l'arrondissement d'Alais. [Exploiting the national forests of northern Alais.]** Bull. Trimest. Soc. Forest. Franche Comté et des Provinces de l'Est **16:** 18–27. *3 pl.* 1925.—The State forests of the northern part of the department of Gard contain some splendid plantations of *Pinus laricio, P. sylvestris,* and *P. maritima.* The topography is rough, with elevations from 400 to 1500 m. It is the natural region of chestnut, and beech and chestnut reproduce naturally. At 1200 m. *Abies pectinata* occurs naturally. In starting exploitations in these forests, cleanings and thinnings are the 1st need. Cuttings must be light in order to avoid the formation of undergrowth which would increase the fire hazard. Chestnut and beech should be encouraged since they are less inflammable. On good soils the average annual growth should be at least 3 cu. m. to the ha.—*J. Kittredge, Jr.*

8605. Jugoviz. **Vom "Deutschen Forstvereine" und zu seiner Tagung in Bamberg vom 14 bis 20 September, 1924. [The meeting of the German Forestry Association at Bamberg.]** Oesterreich. Vierteljahresschr. Forstw. **42:** 22–25. 1924.

8606. Junack. **Aufforstung der Eulenkahlschläge. [Afforestation of areas that were clear cut as a result of owl-moth damage.]** Deutsch. Forstzeitg. **40:** 687–688. 1925.—While mixed stands are desirable, tolerant and intolerant species should not be planted together. The intolerant birch, pine, or larch should be established first, and the tolerant species should be introduced later, generally at the time of the 1st or 2nd thinning.—*W. N. Sparhawk.*

8607. Junack. **Zum Artikel: "Eine eigentümliche Beschädigung des Maitriebes von Pinus silvestris durch die Julistürme im Jahre 1922." [Note on the article "The peculiar injury to the new shoots of Pinus silvestris caused by the storms of July 1922.]** Zeitschr. Forst- u. Jagdw. **55:** 656–657. 1923.—The defoliation of *Pinus silvestris* shoots is attributed to the June beetle (*Rhizotrogus solstitialis*), rather than to rubbing of the shoots against each other in heavy wind. [See Bot. Absts. 13, Entry 5813; 14, Entry 243).]—*J. Roeser.*

8608. Kessell, S. L. **Report of the forests department for the year ended 30th June, 1924.** Ann. Prog. Rept. Forests Dept. Western Australia **1924:** 1–47. 1924.—The area of State forests was increased by 1,710 acres and the area of timber reserves by 4,160 acres. The gross revenue for the year amounted to £127,253, or £39,595 more than that for 1922. The results accomplished in forestation work to date are summarized.—Detailed statistics are given in 8 appendices.—*C. F. Korstian.*

8609. Kimball, K. E. **Forest fires and taxation.** North Carolina Geol. and Economic Surv. Circ. [Raleigh] 11. *1–15.* 1925.—This is a brief study of the destruction of forest values by fire and the effect on county tax rates in 10 counties of North Carolina.—*C. F. Korstian.*

8610. Kinnman, Gunno. **Studier rörande flytbarheten hos flottgods. [Studies concerning the buoyancy of logs in river-driving.]** Skogsvårdsför. Tidskr. **23**: 1–36, 105–124, 145–182. 1925.—The average loss from sinkage in log-driving in Sweden varies from 2 to 3% over a number of years, being greater for pulp wood than for sawlogs. Rapids cause sinkage because the resinous bark is rubbed off on rocks, etc. Recovery of sunken logs in rivers is unprofitable. Extensive experiments indicate that sapwood and wood previously soaked and dried absorbs water faster and to a gerater extent than heartwood. Tests were also made with frozen, decayed and impregnated wood. Special attention was paid to the effect of season of cutting, rate of growth, age, site quality, and percentage of bark and of heartwood, on the buoyancy of logs. Buoyancy may be increased by felling trees in the summer and leaving the branches on until fall; by proper methods of peeling and cutting the logs; by cutting at the proper season; by drying the logs before placing them in the water; and by proper selection of storage sites and time of driving. Spruce floats best, pine and birch not so well.—*Henry I. Baldwin.*

8611. Knudsen, Gunnar. **Lidt om Stednavnene i vore Skove. [The names of our forests.]** Dansk Skovfor. Tidsskr. **10**: 5–21. 1925.—The historical significance of Danish forest names is shown by numerous examples and explanations.—*W. H. Meyer.*

8612. König. **Die Forleule und ihr jüngster Frass. [The pine owl-moth and its latest outbreak.]** Forstwiss. Centralbl. **47**: 393–415. 1925.—While there have been numerous epidemics of this moth in Germany during the last 150 years and probably earlier, the outbreak of 1923–1924 covered a greater area than any recorded insect epidemic except that of the nun moth in Russia and Germany, from 1845 to 1860. With 170,000 ha. completely and 320,000 ha. partially defoliated, the damage was enormous, although it is not yet possible to estimate the amount. Many defoliated trees will recover, while many that have apparently recovered will succumb to the attacks of bark beetles and other enemies. The warm, damp summer and fall of 1924, following the defoliation, favored the growth of new foliage, but there is still much danger from bark beetles, especially *Hylesinus piniperda.* Existing knowledge concerning the courses of the epidemic, prospects of recovery, and preventive and remedial measures, is outlined, and a bibliography of 103 titles is cited.—In general, stands composed of more than 1 species, and with all age classes intermingled, should be grown in preference to pure, even-aged pine forests. Mixed stands are better for the soil, give higher yields, are less attractive to monophagous insects, and favor the development of numerous parasitic insects and birds which keep destructive insects in control. In reforesting the devastated areas, seed and plants of native races should be selected. The fact that many individual trees in defoliated stands escaped injury suggests the possibility of breeding resistant strains.—*W. N. Sparhawk.*

8613. Kotze, J. J. **Wood charcoal and its manufacture.** Union South Africa Forest Dept. Bull. 1 (of 1919). *1–17. 14 fig.* 1920.—The chemical and physical properties, uses, and methods of producing charcoal are discussed.—*C. F. Korstian.*

8614. Kramer, F. **Een kultuur van Pinus insularis Endl. op Java. [Plantation of Pinus insularis Endl. in Java.]** (With English summary.) Tectona **18**: 296–304. *Fig. 2–3.* 1925.—*Pinus insularis* imported from the Philippines in 1916 did very well in the Preanger Mountains at an altitude of 1600 m. The average height of the trees at 7 years was 11.3 m., the average diameter 16 cm., and the mean annual increment (more than 5 cm. diameter) 16.1 cu. m. per ha. Resin tapping at 3 day intervals gave a somewhat larger production than tapping once a week. The quantity and the quality of the resulting resin and turpentine were satisfactory. —*Charles Coster.*

8615. Kramer, F. **Kultuurproeven met eenige wildhoutsoorten. [The cultivation of some useful trees.]** Tectona **17**: 1143–1162. 1924.—This is a short description of the cultivation and value of several costly woods (*Dalbergia latifolia* Roxb., *Pterocarpus indicus* Willd., *Swietenia mahagoni* Jack., and *S. macrophylla* King); of some species for ordinary industrial purposes (*Artocarpus integra* Merr., *Cassia siamea* Lam., *Peronema canescens* Jacq., *Santalum album* L.); and some trees yielding tanbark (*Acacia leucophloea* Willd., *Adenanthera microsperma* T. & B., *Albizzia procera* Benth.). The rate of growth and other qualities are discussed.—*Charles Coster.*

8616. Kramer, Wm. P. **El jardín arbóreo de Arnold y el proyectado jardin arbóreo de Puerto Rico. [The Arnold arboretum and the projected Porto Rican arboretum.]** Rev. Agric. Puerto Rico **14:** 85–87. 1925.

8617. Kramer, Wm. P. **Imposición contributiva sobre terrenos forestales. [Taxes on forest lands.]** Rev. Agric. Puerto Rico **14:** 102–109. *2 fig.* 1925.—Changes in the method of taxing forest lands in Porto Rico are suggested.—*John A. Stevenson.*

8618. Kramer Wm. P. **La Casuarina.** Rev. Agric. Puerto Rico **12¹:** 15–16. 1924.—The Casuarina or "Australian pine," an exotic tree, is proving of great value in reforestation work in Porto Rico. It makes rapid and satisfactory growth under all of the varying conditions under which it has been planted. *C. equisetifolia* has proved easier to handle in transplanting, as well as more adaptable to site conditions, than *C. cunninghamiana.* A description of the tree and its wood is given.—*John A. Stevenson.*

8619. Krauch, Hermann. **The intolerance of western yellow pine regarded as a regulating factor in the maintenance of the type.** Jour. Forest. **20:** 463–464. 1922.—Western yellow pine generally requires full sunlight even in the seedling stage. This intolerance serves to prevent restocking before stands are fully mature, thus preventing possible detriment to both old and young trees through competition for moisture. Reproduction should not be expected till the stand is mature, nor should the stand be cut before reproduction has become established.—*Philip C. Wakeley.*

8620. Krauch, Hermann. **The use of diameter age charts in yield studies.** Jour. Forest. **20:** 390–392. *1 chart.* 1922.—In determining yield it is generally desired to know how long it will take trees to grow to merchantable size or how large they will be at the end of a certain period. A diameter-age chart makes such information easily available for uneven-aged stands, where growths must be calculated separately for each diameter class.—*Philip C. Wakeley.*

8621. Krausse, Anton. **Entomologische Mitteilungen. Einige Notizen über Hylobius abietis L. [Entomological information. A few notes concerning Hylobius abietis L.]** Zeitschr. Forst- u. Jagdw. **55:** 488–490. 1923.—In May and June, 1923, a large number of these insects were studied in captivity. It was found that *Hylobius* eats not only the bark of twigs, but under certain conditions can almost gnaw through slender twigs. Hungry beetles consumed the bark and leaves of twigs from various broad-leaved species, including hornbeam, horse-chestnut, Virginia creeper, maple and syringa, but not from bladdernut. The beetles made no attempt to bore through the soil to portions of pine roots and stems which were buried in sand, even under the shallowest covering.—*J. Roeser.*

8622. Lagerberg, Torsten, Gustav Lundberg, och Elias Melin. **Om upplagraing av sågtimmer i skogen. [The storage of sawlogs in the forest.]** Skogen **12:** 111–117. *2 pl.* 1925.—Unpeeled logs may best be protected from blue stain fungi by piling in shady places, and covering with sod. Peeled wood should be covered with spruce, or other coniferous branches. Timber so treated will deteriorate but little in 1 summer, but should be utilized before the next spring.—*Henry I. Baldwin.*

8623. Leeder, K. **Fünfzig Jahre Forstliche Versuchsanstalt. [Fifty years of forest experiment station work.]** Oesterreich Vierteljahresschr. Forstw. **42:** 19–22. 1924.—This is a brief history of the Austrian forest experiment station from 1874 to 1923.—*K. W. Woodward.*

8624. Leeder, K. **Unsere Exkursion ins Leithagebirge. [Our excursion to the Leitha Mountains in Styria.]** Oesterreich. Vierteljahresschr. Forstw. **42:** 39–51. 1924.—This is an account of the excursion of the Austrian forestry association in March, 1924.—*K. W. Woodward.*

8625. Leeder, K. **Zur Reform des Bundesforstverwaltung. [The reform of the federal forest administration.]** Oesterreich. Vierteljahresschr. Forstw. **42:** 26–29. 1924.—This is a protest against the application of financial standards alone in managing the Austrian state forests.—*K. W. Woodward.*

8626. Lelyveld, G. van. **Iets over de lichtbehoefte der boomsoorten. [Light requirement of tree species.]** Landbouwk. Tijdschr. **37:** 113–122. 1925.—Besides temperature and moisture, light is of great importance in forestry. Light and shadow trees have long been distinguished. The writer suggests that (1) the difference in light requirement is a specific property; (2) light plays an unimportant part, compared with other factors, for example, edaphic, atmospheric, etc.; (3) trees have a specific sensitivity for light which can be influenced by the factors mentioned under (2). The investigations of Fricke, Wiesner, Lubimenko are mentioned.—*J. C. Th. Uphof.*

8327. Lundberg, Gustaf. **Instruktionsfilm rörande släckning av skogseld. [Instruction film concerning extinguishing forest fires.]** Skogen 12: 167–170. 1925.—This film contains many innovations, including maps showing how a typical fire spreads, and tactical methods of fire-fighting.—*Henry I. Baldwin.*

8628. M., C. M., E. Laitakari, W. Kaurin, og Nils Schager. **Nordisk skovbrug i 1924. [Scandinavian forestry in 1924.]** Dansk Skovfor. Tidsskr. 10: 97–127. 1925.—Reports on forestry conditions, production, consumption, etc., are given for Denmark, Finland, Norway, and Sweden. [See also Bot. Absts. 14, Entry 5224.]—*W. H. Meyer.*

8629. Malmström, Carl. **Några riktlinjer för torrläggning av norrländska torvmarker. [Some directions for the draining of peat bogs in Norrland.]** Skogen 12: 129–154. *8 fig.* 1925. —Although attempts at ditching the extensive areas of bog in northern Sweden have been on the whole successful in reclaiming land for foresty and agriculture, investigations indicate that the drainage system should be planned with more regard for the character of the peat, and the more or less complicated hydrostatic conditions prevailing in the bog. There are 3 main classes of bogs, based on their mode of origin: Plateau bogs, arising from the filling up of glacial lakes; former forests lands on which swamps have encroached; and bogs arising from vegetation filling up streams and causing them to overflow. Owing to the relative impermeability of the lower peat layers, which retard the passage of ground water and cause it to overflow about the edges, bogs, especially of the 1st class, tend to creep up on the firm land and become larger. It is, therefore, most important to dig ditches along the borders of bogs, and to cut through permeable soil layers, so that the trapped water may escape. —*Henry I. Baldwin.*

8630. Marie-Victorin, Frère. **Esquisse systématique et écologique de la flore dendrologique d'une portion de la rive sud du Saint-Laurent, aux environs de Longueuil, P. Q. [Systematic and ecological sketch of the dendrological flora of a portion of the south shore of the St. Lawrence River, in the vicinity of Longueuil, P. Q.]** Contrib. Lab. Bot. Univ. Montréal 1: 1–33. 1922.—This paper embodies the result of 15 years of study of dendrological problems in a limited territory near Montreal, Canada. Following brief sketches of the local physiography and geology, together with historical data on the removal of the forest, the author describes the ecological features of the trees and shrubs. Among particular topics discussed are: (1) The mode of invasion of *Betula populifolia;* (2) polysamary in *Acer saccharum;* (3) the enigmatic morphology of *Acer Negundo;* (4) the growth forms of *Ulmus americana;* (5) the geotropism of *Fraxinus pennsylvanica;* (6) the ecological problems of *Hicoria;* (7) *Salix longifolia* as a water level indicator; and (8) the taxonomy and geographical origin of local species of *Crataegus.*—*Author.*

8631. Martin, H. **Die Anwendung der Bodenreinertragslehre mit besonderer Berücksichtigung der sächsischen Staatsforsten. [The application of the soil rent theory with especial reference to the Saxon State forests.]** Tharandter Forst. Jahrb. 75: 247–260. 1924.—The soil rent theory is defended as a principle. The lowered yield of the Saxon state forests is ascribed to improper soil management.—*K. W. Woodward.*

8632. Mason, David T. **Forest management in the redwood region of California.** Jour. Forest. 20: 396–397. 1922.—The original area of redwood forest (*Sequoia sempervirens*) was about 1,400,000 acres, of which 450,000 acres have been cut over. The remaining stand is 85% redwood, with Douglas fir, lowland fir, and Sitka spruce. The annual cut of redwood is 500 million board feet, produced by about 20 companies, many of which are preparing to put their lands under permanent forest management.—*Philip C. Wakeley.*

8633. Meinecke, Th. **Das Kohlensäureproblem. [The carbon dioxide problem.]** Zeitschr. Forst- u. Jagdw. 55: 708–711. 1923.—Schmidt's investigations are mentioned (see this issue, Entry 8470). It is pointed out that agricultural crop plants grow under different conditions than do forest trees. The deciding factor in the development of forest trees is said to be the amount of CO_2 available. More should be known concerning the value of CO_2 and means of increasing its production in the forest.—*J. Roeser.*

8634. Methner, A. **Aufforstung von Grosskahlschlägen im Eulengebiet. [Reforestation of clear cut areas in the districts infested by the owl moth.]** Deutsch. Forstzeitg. **40:** 639–641. 1925.—While *Pinus silvestris* will be the principal species, it is very important to avoid extensive pure stands. On poor soils birch and larch should be mixed with the pine, and on better soils oak and beech, with groups of spruce and Douglas fir on moist sites. Pine is subject to more dangers, including various insects, fungi, and others, than any other species. On moist, sheltered sites spruce, together with ash, hornbeam, and alder, may be substituted for pine. In some places pure, broad-leaved stands are desirable, not only for fire protection but also because they shelter more beneficial insects and birds than conifer stands. Of exotic species, Douglas fir, Japanese larch, and Sitka spruce are recommended. Whatever species are used, care should be taken to select seed from the best races.—*W. N. Sparhawk.*

8635. Methner, A. **Ödlandsaufforstung in Norddeutschland. [Afforestation of waste land in northern Germany.]** Deutsch. Forstzeitg. **40:** 493–496. 1925.—On poor sandy soil best results have been obtained by "ridge" planting. The brush cover is burned off in September and the ground plowed deeply, throwing up ridges 40 cm. high and 1½ m. apart. These are allowed to settle over winter, in the spring strong, 1-year pines are planted, and yellow lupine seed is sown along the ridges to improve the soil and keep down weeds. The following September, birch seed is scattered to form a mixed stand.—On sites with dry turf, this is partly removed in strips, leaving a layer 3 cm. thick to be mixed with the mineral soil. The strips are thoroughly harrowed, and pine is planted, birch seed being sown in the fall. Lupine is used if the soil is poor.—Where "ortstein" occurs near the surface pine seedlings become sickly after 4–5 years. Such sites should be plowed deep enough to break up the "ortstein," and sown with lupine, birch and later with beech. Where the "ortstein" is deeper than 40 cm. it cannot be broken by plowing, but ridge planting will give the roots room to grow.—On high moors the dense growth of plants such as *Erica tetralix, Ledum palustre, Myrica gale, Empetrum nigrum,* and cranberry, is a serious obstacle to planting and should be removed if possible. *Picea sitchensis* does best on such sites, but *P. excelsa,* alder, and birch may also be used, with Canada poplar along the edges. Drainage is necessary.—In swamps, ash saplings may be planted on hillocks or dykes 3 m. apart, with Sitka or common spruce between. For swamp planting, conifers must have long roots (3–4 year transplants) to avoid frost heaving. Putting sand in the planting holes is recommended.—*W. N. Sparhawk.*

8636. Michigan Department of Conservation. **Biennial report, fiscal year, 1923–1924.** *307 p. 78 illus. 1 fig. 1 map.* Lansing, Michigan, 1925.—The report covers the work of the Divisions of Game, Fish, Forest Fire Control, Forestry, Land Economic Survey, Public Lands, State Parks, Geology, Predatory Animal Control, and Education. Reporting for the Division of Forestry, the State Forester outlines the present status and development of State forests in Michigan, describes their protection, and discusses the Division's forest nursery and planting activities. Reporting for the Division of Forest Fire Control, the Chief Forest Fire Warden describes the State's system of protection against forest fires, and presents figures of loss, damage, cost of suppression, etc., for the calendar years 1923–1924. Ways and means for the prevention and control of railroad fires are also described.—*J. A. Mitchell.*

8637. Micklitz, Th. [Rev. of: Hufnagel, L. **Praktische Forsteinrichtung. (Practical forest regulation.)** *3rd ed. 100 p.* W. Frick: Wien und Leipzig, 1921.] Centralbl. Gesam. Forstw. **47:** 105–113. 1921.—Many of the author's statements are criticized. Hufnagel answers the criticisms in detail (p. 113–118).—*W. N. Sparhawk.*

8638. Monroy, [Joh. Albr.] von. **Reisebilder aus holländischen Forsten. [Notes on Dutch forests.]** Deutsch. Forstzeitg. **40:** 663–665. *Fig. 1–2.* 1925.—In afforesting heaths, *Pinus silvestris* is used as the principal species, with mixtures of beech on the better sites, red oak and Japanese larch on the poorer, and *Pinus rigida* on the least fertile. Cultivation of lupine and inoculation of the soil with compost help to enrich the soil with nitrates.—*P. laricio* is planted on the coastal and *P. silvestris* on the inland dunes. The sand in the plant holes is usually mixed with peat mold in order to conserve moisture.—On old forest soils the formation of raw humus is prevented by frequent, fairly heavy thinnings, and underplanting of species with widely spreading root systems, such as Douglas fir, horse-chestnut, and red oak.—*W. N. Sparhawk.*

8639. Morbeck, George C. **A Minnesota forest problem—to keep pine lands productive.** Jour. Forest. 20: 533–537. 1922.—Care in logging is important, and fire protection a necessity. There is considerable advance growth in virgin stands.—*Philip C. Wakeley.*

8640. Münch, von. **Bodenpflage im Kiefernwald durch Bestandespflege und Unterbau. [Soil improvement in pine forests by silvicultural operations and underplanting.]** Deutsch. Forstzeitg. **40:** 622–625, 641–645, 665–668. 1925.—Maintenance of soil fertility and conservation of soil moisture are essential to increase the yields of east German pine forests. Light thinnings from above should commence early and be repeated frequently, leaving healthy subordinate trees to protect the soil. Litter and slash should be scattered to retard evaporation and weed growth. Swine, where available, do much good by rooting and thus loosening the soil. They will not root on areas covered with sedge or reindeer moss. Tolerant species, especially birch, should be mixed with pine to provide leaf-litter and shade. Results are best if the beech is introduced while the pines are small, although money can be saved sometimes by leaving the beech underplanting to squirrels.—*W. N. Sparhawk.*

8641. Munns, E. N. **Reproduction and nitrogen.** Jour. Forest. **20:** 497–498. 1922.—Eight-year-old western yellow pines in a patch of lupine (*L. grayii*) on a burn in the Stanislaus National Forest (California) were 23 inches taller than those outside of the lupine, apparently because of the more abundant available nitrogen.—*Philip C. Wakeley.*

8642. Myer, J. E. **Ray volumes of the commercial woods of the United States and their significance.** (Thesis, New York State College of Forestry, Syracuse.) Jour. Forest. **20:** 337–351. 1922.—The relative volumes of medullary rays were studied in 38 species of softwoods and 54 hardwoods. The samples were taken from the boles of the trees, where variations traceable to differences in growth conditions are least evident. Ray volume, determined by analysis of photomicrographs of tangential sections, is given for each species. It is concluded that the major variations in ray volume are specific rather than the result of environment, and that variations are closely associated with numerical changes in specific gravity, hardness, modulus of rupture and compression perpendicular to the grain. Shearing strength and compression parallel to the grain are also influenced. Ray volume in hardwoods exceeds that in softwoods by about 10%.—*Philip C. Wakeley.*

8643. N., J. W. **An American text-book of forestry.** [Rev. of: Moon, Frederick Franklin, and Nelson C. Brown. **Elements of forestry.** *409 p. Illus.* John Wiley & Sons: New York, 1924 (see Bot. Absts. 14, Entry 1321).] Indian Forest. **51:** 218–220. 1925.—The book is asserted to have little value for forestry students, because it is too descriptive and generalized. It may serve as an educational medium in calling attention to the need for forestry. The authors' definition of forestry is critized.—*E. N. Munns.*

8644. National Conference on Utilization of Forest Products. **Report of the national conference on utilization of forest products.** U. S. Dept. Agri. Misc. Circ. 39. *1–100. Illus.* 1925.—This booklet includes the papers presented at the conference held in Washington, D. C., November 19–20, 1924, the recommendations adopted, lists of the participating organizations and delegates, and a digest of the problem of wood waste prevention, prepared by Rolf Thelen.—*W. N. Sparhawk.*

8645. Neubauer, Wilhelm. **Zum Methodenstreit in der forstlichen Statik. [The controversy over methods in forest statics.]** Centralbl. Gesam. Forstw. 47: 213–232, 269–289. 1921.—Hönlinger's views regarding soil rent and forest rent are criticized. The soil rent theory, which is based on the ideal of maximum profit from the private economic standpoint, starts with bare land, assumes a periodic yield, and requires the return of compound interest on costs of forest management. The forest rent theory, based on the ideal of maximum production (public economic viewpoint), recognizes the fact that most forests have gradually developed from the wild forest that originally cost nothing, assumes an annual yield, and avoids interest computations. If profit to the private owner were the only consideration, no one would grow forests on land with a negative soil value, that is, where the yields repay the costs of establishment and management, but do not pay interest on such costs at the prevailing rates.—*W. N. Sparhawk.*

8646. Nevermann, Ferdinand. **Das Balsaholz. [Balsa wood.]** Tropenpflanzer 25: 49–52. *1 fig.* 1922.—The wood of *Ochroma lagopus* is very light, white, and porous; its average weight is about 125 kg. per cu. m. (cork 240 kg.). The faster the tree grows, the lighter is the wood. Isolated trees reach a diameter of 1.30 m. at 1 m. from the ground, and a height of 15 m.; whereas in the forest few trees are more than 60 cm. in diameter, but they reach heights of 50 m. About 1000 ha. have been planted with this species in Costa Rica.—*J. C. Th. Uphof.*

8647. New Hampshire Forestry Department. **Forest resources of New Hampshire.** *59 p. 12 fig.* New Hampshire Forest. Dept.: Concord, 1923.—Of an estimated land area for the State of 5,646,051 acres, 1,008,585 acres is agricultural land and 1,012,753 acres bears merchantable timber. Towns, roads, and other non-productive land amount to 202,673 acres, and the rest is about evenly divided between young timber growth and poorly stocked forest land. The areas and stands of merchantable timber and young growth are given by counties. There are 2,191 million board feed of merchantable pine, 2,414 million feet of spruce and other softwoods, and 2,715 million feet of hardwoods. The total value of 4,434,793 acres of forest land is put at $95,066,927. Data are presented on cut and consumption of timber in the State, fire damage and expenditures, and expenditures for combatting forest insects and diseases, and reforestation. Suggestions are made for reform in forest taxation.—*W. N. Sparhawk.*

8648. Ostwald, E. **Zur Theorie und Praxis der Forstertragsregelung. [The theory and practice of forest regulation.]** Tharandter Forst. Jahrb. 75: 189–239. 1924.—The effect of various methods of forest regulation is illustrated, using yield tables and price data.—*K. W. Woodward.*

8649. P. [Rev. of: Berlepsch, von. **Der gesamte Vogelschutz, seine Begründung und Ausführung auf wissenschaftlicher natürlicher Grundlage. (Protection of birds.) 10th edition.** *301 p.* J. Neumann: Neudamm, 1923.] Forstwiss. Centralbl. 47: 352–354. 1925. —The great importance of birds in protecting forests against insect depredations is pointed out.—*W. N. Sparhawk.*

8650. Paul, B. H. **Seedling vs. transplanted stock for forest planting.** Jour. Forest. 20: 393–395. 1922.—New York State reports on the planting of 797,500 2-year seedlings of white, Scotch, and red pines and Norway spruce indicate that seedlings do poorly (less than 50% survival) on dry, sandy sites unprotected by vegetation, but better on loamy or more grassy or weedy sites; that seedlings succeed on old meadow or pasture sites when moist enough and not too heavily covered with vegetation; that replanting of seedlings was necessary in ½ the cases reported, and that persons who have tried both seedlings and transplants generally prefer transplants.—*Philip C. Wakeley.*

8651. Pederson, F. C. **The forests of the valley coal fields of Virginia.** Virginia Forest. Publ. 34. *1–19. 6 pl.* 1925.—The topographic, economic and forest conditions in the semianthracite coal region of Wythe, Pulaski, and Montgomery Counties, Virginia, are described. The need for conservative management of the forests is stressed.—*C. F. Korstian.*

8652. Pederson, F. C. **The forests of Wise County, Virginia.** Virginia Forest. Publ. 29. *1–21. 8 pl.* 1924.—The topographic, climatic, economic and forest conditions in the county are described and the need is stressed for applying forestry principles in caring for the forests which comprise about 85% of the area.—*C. F. Korstian.*

8653. Peirson, H. B. **Mound-building ants in forest plantations.** Jour. Forest. 20: 325–336. 1922.—Mound-building ants (*Formica exsectoides*) have killed *Pinus strobus* in plantations in many places throughout New England. The ants occur also in Virginia, Pennsylvania, New Jersey, Michigan, and Wisconsin. In some case the trees are killed for a distance of 30 feet around the mound. Other woody species killed or injured are *Pinus sylvestris, Juniperus communis, J. virginiana, Populus tremuloides, Hicoria ovata, Betula populifolia, Quercus ilicifolia, Pyrus malus,* and *Rhus hirta.* The hardwoods are defoliated or so badly wounded as to snap off in the wind; the pines die from girdling just above the ground. No root injury is evident, and fungi found in the lesions, including species of *Phoma* and *Fusicoccum,* failed to infect healthy trees. Ants were found wounding trees and squirting formic acid into the wounds, and similar treatment with commercial formic acid in the laboratory produced identical lesions. The author gives directions for controlling the ants with carbon bisulfid, suggests possible control with *Bacillus acridiorum,* and cites 16 references.—*Philip C. Wakeley.*

8654. Perry, Geo. S. **The special planting problems in Pennsylvania.** Jour. Forest. 20: 507–512. 1922.—In Pennsylvania the conifers of the virgin stands have been largely replaced by slow-growing hardwoods. The author holds that on medium and adverse sites conifers should and will be reestablished. Scrub oak areas will work out their own salvation if protected from fire. Hardwood stands may be converted to softwood either by planting with transplant stock after clear-cutting or by underplanting with seedlings 1-2 years before cutting. Mine dumps, old burns, and similar barren areas should be planted in early spring with large nursery stock of aggressive, intolerant species like Scotch, pitch, Banks, Jersey, and table mountain pines.—*Philip C. Wakeley.*

8655. Perry, Walter J. **A word for the lowly pinon.** Jour. Forest. 20: 521-526. 1922. —Because of its value for watershed protection, for fuel, and especially for its edible seed, *Pinus edulis* of the southwestern U. S. A. should not be cut for railroad ties, but should be subjected only to careful improvement cutting.—*Philip C. Wakeley.*

8656. Petrini, Sven. **Intryck från privatforstmästareföreningens exkursion till Östra Finland Sommeron 1924. [The Private Foresters' Association's excursion to eastern Finland in the summer of 1924.]** Skogen 12: 155-166. 1925.—*Pinus sylvestris* reproduces well in Finland, and fine stands occur on abandoned agricultural land, as a result of clearing land by fire.—*Henry I. Baldwin.*

8657. Phillips, John F. V. **The biology, ecology and sylviculture of "Stinkwood," Ocotea bullata, E. Mey. Introductory studies.** South African Jour. Sci. 21: 275-292. 1924.—*Ocotea bullata*, one of the most valuable South African timber trees, is found chiefly in the forests of George, Knysna and T'Zitzikama, and in a few other scattered localities. Its distribution in the Knysna region is described in detail. Flowering, fruiting, and other phenological data are presented and the influence of type of flowering upon fruit crop is demonstrated by means of statistical phenological records. The nature, dispersal, and germination of the fruit, the histology of the leaf, and the so-called Acarodomatia on the leaves are discussed. Symbiotic and pathological relations and the rate of growth are dealt with briefly.—Nursery practice, vegetative propagation, transplantation, felling practice, and methods of natural regeneration are also discussed. It is believed that stinkwood can be grown economically in managed forests.—*Author.*

8658. Pinsker. **Die Stellungnahme der österreichischen Bundesforstbeamtem zu der geplanten Reform der österreichischen Bundesforstverwaltung. [The position of the Austrian federal forest officers on the projected reform of the Austrian Forest Service.]** Forstwiss. Centralbl. 47: 339-348. 1925.—The proposal to commercialize and to centralize control of the State forests is unanimously opposed as contrary to the public interest. The goal of State forestry should be maximum continuous production, or the greatest good to all, while the goal of a commercial undertaking is the greatest immediate profit.—*W. N. Sparhawk.*

8659. Prell, H. **Kritische Bemerkungen zu Wolff und Krausses Buch über die Krankheiten der Forleule.** [Rev. of: Wolff, Max, und Anton Krausse. **Die Krankheiten der Forleule und ihr prognostische Bedeutung für die Praxis. (Diseases of the pine owl moth (Noctua piniperda or Panolis flammea).)** *102 p. Illus.* Wilhelm Korn: Breslau, 1925.] Forstwiss. Centralbl. 47: 377-391. 1925.—A large number of passages are cited which are erroneous or in need of amplification.—*W. N. Sparhawk.*

8660. Recknagel, A. B. **Growth of spruce and balsam in the Adirondacks.** Jour. Forest. 20: 598-602. 1922.—The tables give current annual increment (in percentages) based both on the last inch of radial growth and on the last 30 years' growth, for red spruce and balsam fir in the hardwood and the spruce flat types near Newcomb, New York.—*Philip C. Wakeley.*

8661. Recknagel, A. B. **The stand graph as a means of regulating the cut in selection forest.** Jour. Forest. 20: 374-378. 1922.—A stand graph is a curve of number of trees by diameters. In the management of a selection forest it takes the place of the normal age class diagram of the even-aged forest. A graph of the same stand before and after cutting gives a reduction factor for the loss of the smaller trees in logging, which is an important point in calculating the remaining stand and the increment thereon from the original stand table. —*Philip C. Wakeley.*

8662. R[ecknagel], A. B. [Rev. of: Woolsey, Theodore Salisbury, Jr. **American forest regulation.** *217 p.* Tuttle, Morehouse & Taylor: New Haven, Conn., 1922.] Jour. Forest. 20: 545. 1922.—This is a summary of the contents of what is called "the most ambitious text in English on the subject of forest regulation."—*Philip C. Wakeley.*

8663. Reko, B. P. **Nutz- und Edelhölzer Mexikos. [Economic woods of Mexico.]** Tropenpflanzer 25: 16–22, 52–56. 1922.—All the known trees that yield lumber are listed, with common and scientific names.—*J. C. Th. Uphof.*

8664. Reynolds, R. V., and Albert H. Pierson. **Lumber cut of the United States 1870–1920.** U. S. Dept. Agric. Dept. Bull. 1119. *1–62. Pl. 1–2, fig. 1–16.* 1923.—Part 1 is a discussion of the significance of declining lumber production, the increase of prices, and the shift of the producing centers westward. The need for growing timber, especially in the East, is shown.—Part 2 contains detailed statistics of lumber production for 1920, and tables of lumber production by States compiled from Census and Forest Service records, beginning with 1840. For 1840, 1850, and 1860 values are shown; for 1870, 1880, 1890, 1899, and 1904–1920, quantities are given. For 1899 and 1904–1920 the total amounts of each of the principal kinds of lumber are given.—*R. V. Reynolds.*

8665. Robertson, C. C. **The forests of South Africa.** Union of South Africa Forest. Dept. Bull. (Unnumbered). *1–23.* 1924 (?) (Also Empire Forest. Jour. 3: 99–121. 1924.)—The principal types of forests—the cedar forests, the mixed yellowwood and broad-leaved forests, the sub-tropical coastal forests, and the scrub and savannah forests—are described. The forest history and policy, and the organization of the Forest Department and the Research Branch are outlined. Information is given on the government, municipal and private plantations.—*C. F. Korstian.*

8666. Rušnov. **Einiges über die durch den Weltkrieg verursachte Wertsteigerung des Holzes. [Notes on the increased value of wood caused by the World War.]** Centralbl. Ges. Forstw. 47: 142–149. 1921.—In central Europe the consumption of wood for fuel, which was large during the war because coal was scarce, will probably recede to the pre-war status with the resumption of normal trade. Inability to get cotton led to extensive use of wood for nitrocellulose as a basis for explosives. As nitrocellulose can be produced more cheaply from wood than from cotton (in Austria, at least), wood promises to replace cotton as the raw material for manufacture of celluloid, collodium, and artificial silk. It may also replace coal to a considerable degree in the manufacture of illuminating gas.—*W. N. Sparhawk.*

8667. Schaefer, Hedwig. **Die Produktion von Kapok und dessen Stellung in der Weltwirstschaft. [The production of kapok and its place in the world economy.]** Beiheften zum Tropenpflanzer 22: 1–54. 1925.

8668. S[chaeffer], A. **Un point noir dans les conversions classiques. [A defect in the classical methods of conversion.]** Bull. Trimest. Soc. Forest. Franche Comté et des Provinces de l'Est 16: 27–28. 1925.—The sale prices of large oaks from forests of coppice-under-standards are much higher than for those from conversion forests. In the conversion, as the coppice grows to small standards and crowds the larger standards, the large lower branches are killed and often form defective knots which lower the quality and value of the timber. The difficulty can be remedied by cutting the large oaks as fast as they mature, before there is any appreciable depreciation.—*J. Kittredge, Jr.*

8669. Schmanck. **Aus der Praxis über die E. B. R. A. vom 12 März 1919. [Practical consideration of the supplemental working plan instructions of March 12, 1919.]** Zeitschr. Forst- u. Jagdw. 55: 471–488, 513–534, 567–594. 1923.—This is a critical discussion of various phases of the instructions, such as distribution of cut, working sections and rotation.—*J. Roeser.*

8670. Schmidt. **Bestandesalter und Samengüte im Fichtensamenjahr 1921–1922 (in der Oberförsterei Ebersbach, Bez. Wiesbaden). [Age of stand and seed production in the spruce seed year of 1921–1922.]** Zeitschr. Forst- u. Jagdw. 55: 490–495. 1923.—The full seed crop of Norway spruce in the Ebersbach forest in 1921–1922 was used in studying the relationship between age and fructification. The seed crops of the 0–20 and 80–100 year age classes were smaller than those of the others. In general, the culmination of seed production varies within rather wide limits in the middle age of the stand, and corresponds roughly with the period of greatest current increment of the principal trees. Elevation above sea level and soil quality did not seem to influence quantity of production. A study of the variation in quality of seed from individual trees indicated that inherent factors and external stand conditions both play a part.—*J. Roeser.*

8671. Schmidt. **Über neue Untersuchungen zum Kohlensäureproblem. [Recent investigations on the CO_2 problem.]** Zeitschr. Forst- u. Jagdw. 55: 715–717. 1923.—Bornemann's and Meinecke's papers on the subject (see this issue, Entries 8383 & 8443) are commented on. —*J. Roeser.*

8672. Schreiber, M. **Beiträge zur Biologie und zum Waldbau der Lärche unter besonderer Berücksichtigung des physiologischen Prozesses der Transpiration. [Contributions on the biology and silviculture of larch, with special reference to the physiological process of transpiration.]** Centralbl. Gesam. Forstw. **47**: 1–30, 76–99. 1921.—The failure of many larch plantations at low and medium altitudes, while others thrived, has puzzled foresters. The explanation is to be found in the specific physiological characteristics of larch, and particularly in the inherited characteristics of different races resulting from adaptation to external factors of soil and climate. Available information deals with the Tyrolese variety of *Larix europea,* which has been widely planted in north German lowlands. Larch is characterized by a rate of transpiration far exceeding that of other conifers, and even greater than that of most broad-leaved trees. The rate for the alpine variety is probably highest of all. If this tree is to thrive at lower altitudes, the sum of all site factors must result in a rate of transpiration approximately the same as that in its native habitat. The higher air and soil temperatures, with equal relative humidity, and the greater air movement in the north German lowlands would indicate a higher transpiration rate, but the lower atmospheric pressure and greater light intensity in the mountains probably compensate, so that transpiration is about the same in the 2 regions. To maintain a high transpiration rate, the tree must take up a large volume of water, hence ample soil moisture is essential. The larch root system resembles that of other conifers in that it forms a much smaller proportion of the whole plant volume than is the case with roots of broad-leaved trees. As the absorptive surface is comparatively small, the osmotic energy and development of root hairs must be correspondingly large. There must be plenty of available oxygen in the soil, and the soil temperature must be at an optimum, which is fairly low for alpine larch. This tree requires more mineral food than spruce and fir (but less than pine) and cannot extract it from highly concentrated solutions (as pine can), hence if the transpiration rate is too low it will not get enough nourishment. This explains the failure of plantations in localities with stagnant air, high humidity, heavy fogs, or excessive cloudiness. If climatic factors are favorable, larch will do well where the soil is fresh, well aerated, and not too warm. Poor soil conditions frequently result from ill-advised silvicultural treatment, including clear cutting, removal of the litter, and cultivation of mixed stands of spruce and larch. Spruce does not loosen the soil nor does its litter improve soil conditions. It intercepts a large part of the precipitation, and reduces transpiration by increasing atmospheric humidity, and the soil under it contains more CO_2 and less available O than under beech or fir. Beech, and to a less degree, fir, are especially valuable trees to grow in mixture with larch, because of their favorable effect on the soil.—*W. N. Sparhawk.*

8673. Schubert, J. **Die Zuwachsleistung eines Bestandes. [The increment of a stand.]** Zeitschr. Forst- u. Jagdw. **55**: 560–567. *Fig. 1–7.* 1923.—The relation of current and average increment, growing stock, unit increment, yield and costs, and increment as a function of growing stock, also the goal of management to maintain and improve soil and stand quality, are discussed by formula and graph.—*J. Roeser.*

8674. Scott, M. H. **Notes on the physical properties, conversion, seasoning and uses of blue gum (Eucalyptus globulus).** Union South Africa Forest Dept. Bull. 10. *1–4.* 1924.

8675. Scott, M. H. **The blue gum (Eucalyptus globulus). Notes on its physical qualities, conversion and uses.** South African Jour. Indust. **7**: 575–578. *6 fig.* 1924.—A short résumé is given of experiments in seasoning locally grown blue-gum timber. The physical properties and commercial prospects of the timber are discussed. Contrary to the general opinion that blue gum timber from comparatively young trees is almost impossible to season, it was found that a properly piled stack of 1 inch boards should be quite dry in 14–16 months. Only 31 days were required for drying in the fan kiln, while the water spray kiln took 52 days. The difference in time is a result of the quicker air circulation in the fan kiln.—Properly seasoned blue gum makes a beautiful floor and has splendid wearing qualities. The extra cost of laying such a floor, resulting from the necessity of boring nail holes, seems justified. —*L. I. Goldblatt.*

8676. Scott, M. H. **The Saligna gum (Eucalyptus saligna). Notes on its physical qualities, conversion and uses.** South African Jour. Indust. **7**: 504–507. *5 fig.* 1924.—The indigenous forests of South Africa produce mostly hard woods that are not easily worked or suitable for use in general construction. The results of experiments indicate that wood of *Eucalyptus saligna* will prove useful for many purposes if properly cut and seasoned, and that plantations of that species may in time furnish a domestic supply of timber that will take the place of a part of the soft woods now imported.—*L. I. Goldblatt.*

8677. Seiff, W. **Hylobius abietis L. in stehenden jungen Weymouthskiefern.** [**Hylobius abietis in young standing white pine.**] Forstwiss. Centralbl. 47: 334–337. 1925.—This insect, which usually breeds in the roots or stumps of cut trees, was found in standing 8–10 year-old *Pinus strobus.* The unusual occurrence is attributed to the poor site, the dry hot summer, the injury to the trees by deer rubbing their horns, and the attack of other beetles, including *Pityogenes bidentatus, Ips amitinus,* and *Pissodes notatus.* All these factors combined weakened the pines so that they offered a favorable breeding ground for *Hylobius. Pinus silvestris* and *P. pumilio* in the same plantation were uninjured.—*W. N. Sparhawk.*

8678. Seitner, M. **Der Kiefernspanner in Galizien 1915–1917.** [**The pine geometer in Galicia, 1915-1917.**] Centralbl. Gesam. Forstw. 47: 198–213. *1 pl.* 1921.—The depredations of *Bupalus piniarius* in the Galician pine forests are discussed briefly, with a detailed account of the life history of *Anomalon biguttatum* Grav., its most important parasite.—*W. N. Sparhawk.*

8679. Sessingh, C. J. G. **Jaarringvorming bij den Douglas (Pseudotsuga taxifolia).** [**Summer wood production in Douglas fir.**] Mededeel. Rijksboschbouwproefsta. 2^1: 115–120. *3 pl.* 1924.—There is a fairly close correlation between the width of summer wood in the annual ring and the amount of rain received during the summer months. When the surface soil is kept moist by frequent rains, the surface roots function throughout the summer.—*E. N. Munns.*

8680. Sharma, P. D. **The Mäule reaction as a means of distinguishing between the wood of angiosperms and gymnosperms.** Jour. Forest. 20: 476–478. 1922.—The woods of 41 angiosperms (including one monocot) showed a distinct red coloration when treated by the Mäule test. Twenty-seven gymnosperms showed only indefinite yellowish or brownish colors. The test consists of treating the wood in turn with $KMnO_4$ solution, dilute HCl, and NH_3. The 68 species tested are listed.—*Philip C. Wakeley.*

8681. Show, S. B. **Methods of determining yield in even-aged yellow pine stands.** Jour. Forest. 20: 606–610. 1922.—The volume of a sample acre of pure, even-aged, western yellow pine was determined by 5 sample-tree methods—the Hartig, Urich, Metzger, mean sample tree and form factor of mean sample tree. The volumes obtained were remarkably uniform, with an extreme deviation of only $1\frac{1}{2}\%$ from the mean value. There are notes on form factors and mortality.—*Philip C. Wakeley.*

8682. Show, S. B. **Some relations between quality of site and quality of mature timber—western yellow pine.** Jour. Forest. 20: 470-475. 1922.—Quality of timber in yellow and sugar pine is judged by the percentage of upper grade lumber sawed out. In appraising National Forest timber the average selling price of the product is calculated from the estimated percentage and selling price of each grade. From the available data on 26 timber sales the author has prepared tables showing the percentage of upper grades on sites of different qualities, and the percentage of each grade for various total percentages of uppers. The criterion of site is the average height of dominant mature timber.—*Philip C. Wakeley.*

8683. Sims, P. R. **Forest grazing.** Australian Forest Jour. 8: 20-22. 1925.—The burning of grazing lands to produce more grass of a higher nutritive value is coming to be recognized as a fallacy. Controlled grazing in moderation in a forest beyond the seedling stage is conceded to do very little damage to the trees.—*C. F. Korstian.*

8684. Sinz. **Beitrag zur Geschichte des Naunhofer Staatswaldes.** [**A contribution to the history of the Naunhof state forest.**] Tharandter Forst. Jahrb. 75: 274–288. 1924.—This paper deals with the soil, change in species, and changes in management. Interesting tables are presented.—*K. W. Woodward.*

8685. Sparhawk, W. N. **The use of liability ratings in planning forest fire protection.** Jour. Agric. Res. 30: 693–762. *Fig. 1–36.* 1925.—This is a statistical study of the occurrence, spread, damage, and cost of control of fires on the national forests of the western U. S. A. during 1911–1915. An attempt is made to work out a method of predicting probable average fire damage and suppression costs for the various forest types and regions.—*Author.*

8686. Spindler. **Ergebnisse der früheren Fichtensamendarre zu Wildenthal im sächsischen Erzgebirge und anschliessende Gedanken über Ausnutzung des heurigen Samenjahres in den oberen Lagen des genannten Gebirges. [The records of the former seed extraction plant at Wildenthal in the Saxon Erzgebirge and recommendations for taking advantage of the present seed year in the higher parts of those mountains.]** Tharandter Forst. Jahrb. 75: 261–273. 1924.—From the records of seed collection (1835–1872) it is concluded that spruce stands now over 60 years old came from local seed, and that, in order to insure planting stock of the race best adapted to the locality, seed should not now be collected from younger stands, which may be of foreign origin. Normally seed may be collected from December to early in February, but must be collected early if the weather is unusually warm and sunny. Raking or working the mineral soil is recommended as a means of aiding natural reproduction.—*W. N. Sparhawk.*

8687. Spring, Samuel N. **Studies in reproduction—the Adirondack hardwood type.** Jour. Forest. 20: 571–580. 1922.—Studies of beech, birch, and maple reproduction under various logging conditions near Tupper Lake, New York, indicate that where fire is kept out, a satisfactory new hardwood stand follows cutting.—*Philip C. Wakeley.*

8688. Steiger. **Die neuen Vorschriften für die staatlichen Forsterprüfung vom 1 April 1925. [New rules for the State forest ranger examination.]** Deutsch. Forstzeitg. 40: 496–503. 1925.

8689. Stephan. **Forstliche Probleme Schleswig-Holsteins. [Forest problems of Schleswig-Holstein.]** Zeitschr. Forst- u. Jagdw. 55: 449–470. 1923.—The forests of Schleswig-Holstein occupy only 7% of the land area. The cheap reforestation methods of northeastern Germany are not practical in this region, because the presence of heather and unfavorable climatic conditions necessitate intensive soil culture. Pine and spruce do not thrive. The retrogression of pine is attributed to the change from a continental to an oceanic climate as a result of the sinking of the land. The biggest problem is presented by the extensive areas of raw humus and turfy soils. While hardwoods are more or less at home, beech can not be considered the ideal nurse tree as in other parts of Germany, but it must be used in moderation. *Larix leptolepis* is recommended as the most desirable nurse tree for raw humus or turf soils, because of its rapid growth, freedom from the common larch disease, and ability to create favorable soil conditions for other species. The production of pure larch stands with perhaps a light mixture of hardwoods like birch, and without soil culture except where the humus is excessively heavy, is recommended. After the humus conditions have been ameliorated, oak, beech, fir, Sitka spruce, and Douglas fir may be started under the larch. Care must be taken not to get *L. siberica* seed instead of *L. leptolepis* since this is totally undesirble.—*J. Roeser.*

8690. Stephens, H. B. **Experimental timber preservation in South Africa.** Union South Africa Forest Dept. Bull. 11. *1–16. 18 pl.* 1924.—The results of experiments in the preservation of South African timbers against destruction by decay and termites are discussed.—*C. F. Korstian.*

8691. Story, Fraser. **Forestry in Wales.** Welsh Jour. Agric. 1: 201–206. 1925.—This article deals with the development and present position of forestry in Wales. As elsewhere in Great Britain, economic forestry in the Welsh counties may be said to date from 1909, when a Royal Commission on afforestation issued a report which stimulated action and brought about the appointment of forestry advisory officers. After the break occasioned by the War, the British Forestry Commission assumed control of State forestry and established a Government forest service. At present only 4% of Wales is afforested, whereas about 25% consists of mountain and heath land, producing little although for the most part suitable for timber production. The area under timber is only about 184,000 acres, whereas the mountain and heath land below an elevation of 1500 feet is approximately 1,000,000 acres. After allowing for areas unfavorable for tree growth and for parts not readily available for afforestation, there still remains an area of not less than 300,000 acres, which could be profitably utilised for forest cultivation. Such an area is probably capable of producing about 400,000 tons of timber annually, and would ease to this extent the enormous importation of timber from foreign countries. Douglas fir, Sitka spruce, Corsican pine, and Japanese larch are recommended for economic planting in Wales.—*Author.*

8692. S[udworth], G. B. [Rev. of: Pratt, Merritt B. **Shade and ornamental trees of California.** *132 p. 137 illus.* California State Bd. Forest. 1922 (see Bot. Absts. 11, Entry 4153).] Jour. Forest. **20**: 633–634. 1922.—Lists of trees suitable for various regions and soils are given.—*Philip C. Wakeley.*

8693. Swain, E. H. F. **A universal index to wood.** Queensland Agric. Jour. **22**: 278–281. 1924.—The author believes that a count of both pores and rays upon a sufficiently wide field of the transverse section is a virtual summation of all the qualities of porosity and of ray size and distribution. Upon this belief is founded the system of classification which is offered as a possibly universal method of indexing woods. In applying the system a circular plot 5 mm. in diameter is made on the clean transverse cut of the wood and the rays and pores are counted with the aid of a hand lens. The number of rays and pores thus obtained forms a basis for classification.—*W. D. Francis.*

8694. Swain, E. H. F. **From savagery to silviculture.** Australian Forest Jour. **8**: 61–66. 1925.—This paper traces the changes in the forest conditions of the world from the primeval forests of ancient times to the badly depleted modern forests, which the silviculturist is seeking to rehabilitate.—*C. F. Korstian.*

8695. Ten Eick, C. W. **Forestry for Florida farmers.** Florida Grower **31**^{22}: 6, 18. *1 fig.* 1925.—The management of farm wood lots is discussed. The best trees to plant are pecans, oaks, and pines, preferably long leaf or slash (Cuban) pine.—*J. C. Th. Uphof.*

8696. Thelen, Rolf. **Kiln drying handbook.** U. S. Dept. Agric. Dept. Bull. 1136. *1–63. Pl. 1–12, fig. 1–12.* 1923.—General and specific information concerning the kiln drying of wood is presented. Schedules of temperatures and humidities suitable for drying most commercial species of American woods are arranged in tabular form. Drying defects and their remedies are discussed. Methods of making moisture determinations and of using kiln samples for gauging the current moisture content of lumber during drying are given.—The operation of kilns of various types, the principal types of kiln control apparatus and their manner of operation and field of usefulness, and the mechanical details of common methods of producing and maintaining the requisite temperature, humidity, and circulation in a kiln are illustrated and described. The general principles of drying wood are discussed, and data on the relation between the moisture content of wood and the relative humidity of the surrounding atmosphere are shown graphically. Instructions for operating dry kilns and for piling lumber for both kiln and air drying are given.—*Author.*

8697. T[oumey], J. W. [Rev. of: Tillotson, C. R. **Storage of coniferous tree seed.** Jour. Agric. Res. **22**: 479–510. 1921 (1922).] Jour. Forest. **20**: 642–646. 1922.—U. S. A. Forest Service tests, unfortunately not very systematic, in general show sealed containers to be best for storing coniferous seed (see Bot. Absts. 11, Entry 3783).—*Philip C. Wakeley.*

8698. Trevor, C. G. **The yield in U. P. sal forests.** Indian Forest. **51**: 207–211. 1925.—An example is given of the computation of the yield of sal by the Heyer, Andre, Von Mantel, and Hufnagl formulae. None of these gives adequate or reliable results.—*E. N. Munns.*

8699. Tschermak, [Leo]. **Klima und Ausschlagwald. [Climate and sprout forests.]** Centralbl. Gesam. Forstw. **47**: 245–248. 1921.—Coppice or coppice-with-standards does better than high forest in certain warm, semi-humid regions of central Europe, where the available moisture is insufficient to support a thrifty growth of large timber. Such are the plains of Hungary, Rumania, and northern Italy, and portions of the Austrian lowlands.—*W. N. Sparhawk.*

8700. Ulrich, E. S. **Foryngelse af Granbevoksninger ved Selvsaaning. [Reproduction of spruce stands by self-seeding.]** Dansk Skovfor. Tidsskr. **10**: 21–30. *7 fig.* 1925.—The method of cutting and other conditions which resulted in unusually good natural reproduction in the forest at Wrams-Gunnarstorp (Denmark) are described.—*W. H. Meyer.*

8701. Unwin. **Eucalyptus versus grain in the Messaoria.** Cyprus Agric. Jour. **20**: 49–53. 1925.—The author does not advocate planting *Eucalyptus resinifera* on soils suitable for cereal production but rather on poor soils unsuitable for other crops. Methods of sowing or planting the trees are described. Eucalyptus seed are sown in pots or boxes in January or February and the seedlings are transplanted in the open in October, as soon as rain falls. Deep planting (2 feet or more) is advocated, as it tends to conserve moisture. The common planting distance has varied from 6 to 12 feet apart but the author recommends 3 feet. Where possible, watering of seedlings is recommended; a dust mulch or covering the soil with leaves is also desirable. Thinning and pruning and the value of the crop are also discussed.—*W. Stuart.*

8702. Upson, Arthur T. **Better forestry through better utilization.** Jour. Forest. **20:** 465–469. 1922.—In the U. S. A., more than 80% of the volume of the original forest is wasted in manufacturing. Great progress has already been made in chemical and physical reduction of waste. The Forest Products Laboratory at Madison, Wisconsin, has now begun work in coordinating wood-using industries, a new field offering almost unlimited opportunity for conserving raw material. Two investigations are especially important: (1) Standardization of nomenclature, sizes, grades, and specifications for lumber, cross ties, and other wooden products; (2) standardization of the small dimension stock requirements of all secondary wood-using industries.—*Philip C. Wakeley.*

8703. Vestergaard, N. **Jaegersborg Dyrehave. [Jaegersborg game preserve.]** Dansk Skovfor. Tidsskr. **10:** 75–88. 1925.—The problem of regulating cutting in a pleasure forest and game preserve is discussed.—*W. H. Meyer.*

8704. Vloten, H. van. **Het dunnen in Nederlandsche bosschen van grove den. Pinus sylvestris. Orienteerend onderzoek in het "Mastbosch" bij Breda. [Thinning of Scotch pine forests in Netherlands. Preliminary studies made in Mastbosch near Breda.]** (With English summary). Mededeel. Rijksboschbouwproefsta. **1**^{2}: 1–53. *10 maps. 7 fig.* 1923. —Scotch pine needs careful thinning at all stages. Thinning should begin early and should be followed through carefully, keeping in view the biological laws governing growth. Spacing should be regulated so as to obtain maximum growth, good pruning, well developed roots, high resistance to disease, and maximum protection of the soil. The crown should develop with the tree. In thinning, particular attention should be given to crown development.—*E. N. Munns.*

8705. Wahlenberg, W. G. **Reforestation by seed sowing in the northern Rocky Mountains.** Jour. Agric. Res. **30:** 637–641. *Fig. 1–2.* 1925.—This is a report of the results obtained by the U. S. A. Forest Service in direct seeding of *Pinus ponderosa, P. monticola, P. contorta, P. flexilis, Picea Engelmanni, P. excelsa, Larix occidentalis, Pseudotsuga taxifolia and Thuya plicata.* Of the numerous early and extensive projects employing the broadcast, corn-planter, and seed-spot methods, only 6% were successful. Later, more intensive experiments employed the method of sowing in prepared spots. While Douglas fir did better than the other species, none produced a satisfactory stand of seedlings. Less than ⅕ of the spots contained tree seedlings 3 years after sowing. Many of the large seed were eaten by rodents. Drought was the foremost cause of loss among the seedlings; followed by cut-worms and frost heaving. Fungus damage was not severe.—*Author.*

8706. Wesenberg-Lund, C. **Den forstlige Behandling af vore Skoves Dyreverden. [The treatment of our forest fauna from a forestry viewpoint.]** Dansk Skovfor. Tidsskr. **10:** 31–75. 1925.—The forest fauna of Denmark is on the decline. Many species of birds, insects, and fresh water organisms are rapidly dying out. Change of climate has little to do with it. One cause is the change in the character of vegetation from species which are fertilized with the aid of insects to those which are fertilized with the aid of wind. Forestry favors the 2nd class. Many of the breeding places for various insects have been destroyed, ponds have been drained or filled up, and brooks have been spoiled in several ways. Changes in temperature of the water are disastrous to the fresh water fauna. Foresters should increase the proportion of flowering trees and bushes and protect ponds, brooks, and breeding places.—*W. H. Meyer.*

8707. White, C. T., and W. D. Francis. **Queensland trees.** Queensland Agric. Jour. **22:** 308–310. *Pl. 103–104.* 1924.—Some of the field characters and the distribution of *Endiandra compressa* are outlined and the lower part of the stem and herbarium specimens of the species are illustrated.—*W. D. Francis.*

8708. White, C. T., and W. D. Francis. **Queensland trees.** Queensland Agric. Jour. **22:** 356–358. *Pl. 112–113.* 1924.—The field characteristics and distribution of *Flindersia collina* Bail. are outlined, with photographs of the lower part of the stem and herbarium specimens.—*W. D. Francis.*

8709. White, C. T., and W. D. Francis. **Queensland trees.** Queensland Agric. Jour. **22:** 444–446. *Pl. 149–150.* 1924.—The field characteristics and distribution of *Diploglottis Cunninghamii* are outlined. The lower part of the stem and herbarium specimens of the species are illustrated.—*W. D. Francis.*

8710. White, C. T., and W. D. Francis. **Queensland trees.** Queensland Agric. Jour. **23:** 146–148. *Pl. 27–28.* 1925.—Some of the field characters and the distribution of *Geijera salicifolia* are outlined. The lower part of the stem and herbarium specimens of the species are illustrated.—*W. D. Francis.*

8711. White, C. T., and W. D. Francis. **Queensland trees.** Queensland Agric. Jour. **23:** 202–203. *Pl. 45–46.* 1925.—The field characters, distribution, and uses of the timber of *Rhodosphaera rhodanthema* are outlined. The lower part of the stem and herbarium specimens of the species are illustrated.—*W. D. Francis.*

8712. Wirt, Geo. H. **An effective forest fire organization.** Jour. Forest. **20:** 499–506. 1922.—A detailed account is given of the organization required under present plans for protecting Pennsylvania's 13 million acres of forest land.—*Philip C. Wakeley.*

8713. Wittich. **Beobachtungen über Wuchsstockung der Kiefer. [Observations of growth stagnation in pine.]** Zeitschr. Forst- u. Jagdw. **55:** 679–690. 1923.—In the Christianstadt forest, pine is subject to growth stagnation between the 11th and 40th years. Death occurs in abnormally dry years. The degree of stunting varies directly with the abnormality of root development, and is most pronounced on fine sandy soils, and especially on soils from which the humus and litter have been removed. The lack of humus in itself is only a secondary cause, for as soon as soil water penetrates into the root zone, even the most radical removal of litter and humus fails to cause any sickness. While no pan formation was found in the soils of the stand studied, soil compaction was evident, resulting from the reckless removal of humus from poor soils. Because the air capacity of the surface soil is reduced, the acid requirements of the roots are satisfied in the upper layer, and the resulting shallow roots are easily injured by drought.—*J. Roeser.*

8714. Wolff, Max, and Anton Krausse. **Bemerkungen zu der Diskussion über die Maitriebbeschädigung der Julistürme des Jahres 1922. [Remarks on the injury of new shoots by the storms of July, 1922.]** Zeitschr. Forst- u. Jagdw. **55:** 657–660. 1923.—The extensive damage to tender pine shoots in July 1922 was a result of mechanical injury by the unusually heavy, long-continued rain storm. It was not caused by the beetle, *Rhizotrogus solstitialis*, as asserted by Junack. (See also this issue, Entry 8607.)—*J. Roeser.*

8715. Wright, W. G., W. M. Robertson, and G. A. Mulloy. **Forest research manual.** *93 p., 9 fig.*, Dept. Interior (Canada), Forest Branch: Ottawa, 1924.—"The ultimate problem in forest research work in Canada at present is to develop a basis for sustained yield of desirable forest species." Following a summary classification of the problems in silvics, silviculture, and mensuration, this manual outlines methods of carrying on studies by means of (1) permanent sample plots, (2) temporary sample plots, (3) strip surveys and (4) sample trees.—Part 2 takes up methods of studying natural and artificial regeneration, yield, and thinnings, and outlines the use of statistical methods in various investigations.—The use of standard forms, symbols, terms, and instruments is dealt with in the appendix, which also gives general cubic foot volume tables for black spruce, red and white spruce, and balsam fir.—*W. N. Sparhawk.*

GENETICS

Orland E. White, *Editor*

(See also in this issue Entries 8197, 8206, 8273, 8282, 8288, 8339, 8359, 8386, 8413, 8424, 8425, 8426, 8488, 8507, 8593, 8672, 8821, 8868, 8869, 8883, 8906, 8912, 8934, 8950, 9113, 9117, 9146, 9147, 9150, 9159, 9257, 9275, 9302, 9374, 9393, 9525, 9548, 9608, 9622)

8716. Ackermann. **Aus zwanzigjähriger Züchtererfahrung. [Twenty years of breeding experience.]** Beiträge Pflanzenzucht. 7: 33–39. 1924.—This article sums the experiences and ideals resulting from 20 years practical plant breeding. The most successful (private) plant breeder is one who is able to commercialize the finished product with profit after it is once developed. Hybrids were 1st made by the author in 1913, between 2 barley varieties. At a still later period the 1st cross was made in wheat. Wheat hybridization is a matter largely of the future. Extensive laboratory facilities are of very questionable value. German plant breeding leads the world.—*L. R. Waldron.*

8717. Afzelius, Karl. **Embryologische und zytologische Studien in Senecio und verwandten Gattungen. [Embryological and cytological studies on Senecio and related genera.]** Acta Horti Bergiani 8: 123–220. *33 fig.* 1925.—The work deals with the development of the embryo-sac and with the chromosome number of a number of species, about 40 belonging to *Senecio,* 8 to *Ligularia,* 2 to *Emelia,* 2 to *Cacalia,* 2 to *Crassocephalum* and 1 to each of the genera, *Arnica, Cineraria, Culcitium, Gynura, Gynoxys* and *Othonna.* The tetrad-formation in the embryo-sac mother-cell is normal, the chalazal megaspore, rarely someone of the others, developing into the embryo-sac. The number of antipodals may be very different in different species and individual variation is common. Some species have 3–5, seldom but 2, others have 15–20, even up to about 40 antipodals. *Arnica montana* has 2 antipodals, one big upper and another small lower one. *Othonna carnosa* has 3 antipodals that swell and form a sort of haustorium. Most of the species investigated have, however, a more or less multicellular antipodal region. These facts seem to show that Senecioneae and especially *Senecio* are in a lively evolution, at least as regards their embryology.—The haploid chromosome numbers, found in Senecioneae, are 5, 10, 20, 24, 23–25, 26, 29, 30, about 90 and, perhaps, 18. Of these, all but 29 and 18(?) occur in *Senecio.* The basal number of the genus is 5. Polyploidy occurs; X = about 90 was found in 1 species and this species is apparently 36-ploid. The different sub-groups of the genus seem to be characterized by 1 single chromosome number. Thus, of the section *Annui* subsection *Obejacoideae,* 5 species investigated have $x = 10$, while 6 species and forms of subsection *Obejaceae* have $x = 20$; 7 species of section *Jacobaea* have $x = 20$, 5 of *Crociseris* $x = 20$, 2 of *Ecalyculati* $x = 20$, 2 of *Tephroseris* have $x = 24$ and 23–25 respectively; further, 2 species of *Emelia* have $x = 5$ and 6 of *Ligularia* have $x = 30$, while 1 species of the last-mentioned genus has $x = 29$ and one 29 or 30. One single species of *Senecio* also has $x = 5$ (*Senecio discifolius* Oliv.). The 90-chromosome species is a new one, *Senecio Roberti-Friesii* n.sp., from tropical East-Africa. As seen, 1 species has 29 (*Ligularia macrophylla* DC.) and another 24 (*Senecio palustris* (L.) DC.) haploid chromosomes, these being 2 safe cases of deviations from the 5-series. These deviating numbers have probably arisen, through irregular meioses, from the numbers 30 and 25, respectively. Observations were made on the meiosis of the hybrid *Senecio nebrodensis* × *S. viscosus.* The former species has $x = 10$, the latter $x = 20$. In the reduction division, 10 gemini and 10 univalents were found. The meiotic divisions are very similar to those of the Drosera-hybrid, described by Rosenberg. Sometimes 2 parallel homotypic spindles unite and giant pollen-cells arise with the double number of chromosomes.—Finally, a list is given of the species investigated with their haploid chromosome numbers and the number of their antipodals.—*O. Heilborn.*

8718. Allen, Charles E. **Gametophytic inheritance in Sphaerocarpos. I. Intraclonal variation, and the inheritance of the tufted character.** Genetics 9: 530–587. *Fig. 1-60.* 1925.—Clones selected as substantially typical for *S. Donnellii* manifest a wide range of variation under varied cultural conditions; but the variation is not so great as to prevent the appearance of certain fairly definite and easily recognizable characters.—Tufted clones show striking aberrancies especially in the forms of involucres; they are very variable in that the respective branches of a tufted clone show transitional conditions ranging from strictly typical to extremely aberrant. The tufted character is perpetuated by vegetative multiplication; even a strictly typical branch or a single typical involucre of a tufted clone gives rise to a subclone some of whose branches are markedly aberrant.—The gametophytic progeny of a typical ♀ × typical ♂ are all substantially typical, although showing an interclonal variability perhaps greater than the intraclonal variability of either gametophytic ancestor. The gametophytic progeny of a tufted ♀ × typical ♂ includes typical ♀s, tufted ♀s, typical ♂s, and tufted ♂s; apparently the tufted progeny in either sex outnumber the typical progeny.—Between tufted clones of either sex, genotypic differences seem to exist which are expressed in the production of different proportions of aberrant branches.—Two other probably genotypic differences observed between clones here studied concern the appearance of involucral appendages and the separation or non-separation of spores produced from a single mother cell.

One clone resulting from a mating of tufted ♀ × typical ♂ seems to be of a character different from that of either gametophytic ancestor.—*Author.*

8719. Allen, Charles E. **Gametophytic inheritance in Sphaerocarpos. II. The polycladous character.** Genetics 10: 1–16. *Fig. 1–11.* 1925.—"Polyclady" was 1st observed in 2 ♂ plants of *S. Donnellii*, probably of common origin. Polycladous plants are uniformly distinguished by marked aberrancies in vegetative structure and in the development and form of involucres. In males, antheridia are comparatively few, at times entirely absent; in females, archegonia are extremely rare, and their eggs have thus far proved functionless. Typical ♀ × polycladous ♂ gives typical and polycladous progeny of each sex. Tufted ♀ × polycladous ♂ gives tufted, typical, and polycladous offspring of each sex. The progeny of matings of each of these types seems to include, in each sex, a somewhat larger proportion of non-polycladous than of polycladous clones.—*Author.*

8720. Allen, Charles E. **The inheritance of a pair of sporophytic characters in Sphaerocarpos.** Genetics 10: 72–79. 1925.—One ♀ clone of *Sphaerocarpos Donnellii*, however mated, has produced sporophytes with separate spores; the spores of sporophytes resulting from other matings are regularly (under greenhouse conditions) united in tetrads, each tetrad being enclosed in a resistant wall. The formation of a tetrad wall, however, is rarely partially or completely inhibited in strains in which such a wall ordinarily occurs.—The separate-spore tendency is regularly transmitted through the ♀ gametophytic offspring. With 1 possible exception, the genotypic constitution of a ♂ gametophyte has no influence upon the union or non-union of the spores of its sporophytic progeny. The transmission of the tendency to produce separate or united spores thus follows the same course as does the transmission of the X-chromosome. The inheritance of this pair of characters is independent of the inheritance of the tufted—non-tufted pair and of the polycladous—non-polycladous pair.—*Author.*

8721. Barber, M. A., W. H. W. Komp, and T. B. Hayne. **The significance of the proportion of sexes found among Anopheles in various resting places.** Public Health Rept. 40^3: 105–110. Govt. Printing Office: Washington, D. C., 1925.—Observations show clearly that the character of a resting place of *Anopheles* is an important factor in determining the proportion of the sexes found in it—the more accessible the blood, the larger the percentage of females. This factor seems to be more important in the case of *Anopheles crucians* than in the case of *A. quadrimaculatus*. Distance from a breeding place would seem to be a minor factor in the series of observations, if it operated at all.—The habits of Anopheles may vary greatly according to locality, and it may be that under certain conditions the proportion of sexes would be a more reliable indicator of distance from a breeding place than these observations show. It is possible that in more restricted areas of breeding than rice-fields, where most of the work was done, the proportion of sexes would show some relationship to distance. However, in determining the relation of distance from breeding place to the proportion of sexes found, the character of the resting place must be taken into consideration. From the observations made by the authors it does not seem likely that a correlation of sex proportion and distance from breeding-place will be found sufficiently definite and universal to be a reliable guide to field workers.—*W. H. W. Komp.* (*Public Health Engineering Absts.*)

8722. Blackburn, Kathleen B. **Chromosomes and classification in the genus Rosa.** Amer. Nat. 59: 200–205. 1925.—The fundamental chromosome number for the genus *Rosa* is 7. The majority of American species are diploid. The remainder are tetraploid and hexaploid. All forms in this polyploid series are characterized by regular meioses and are fertile. A study of *R. Wilsoni* (*R. pimpinellifolia* × *R. tomentosa*) suggested that polyploid forms originated from forms with a lower chromosome number by a suspended division of the egg cell, giving an embryo with double the expected chromosome number. In addition to a regular series there exists a 2nd rose group, of which the Canina's are a good example, characterized by a failure of chromosomes to pair at diakinesis and resulting in a very irregular distribution of the univalent elements. This partial reduction in the heterotypic division, the formation of micronuclei, extra pollen grains and bad pollen strongly suggest for these unbalanced forms a hybrid origin with parents of unequal chromosome number. The assumption from recent cytological studies in *Rosa* is that balanced polyploid forms arise by hybridity and doubling of chromosomes; the unbalanced ones by hybridity between forms with different chromosome numbers, the former group being fertile, the latter sterile and usually reproducing by apomixis.—*A. E. Longley.*

8723. Blaringhem, L. **Les mutations du maïs. [Mutation in maize.]** Ann. Sci. Nat. Bot. 10ᵉ Sér. 6: 289–328. *Fig. 1–8.* 1924.—A report on further investigations of traumatism as a cause of mutation. A new variety (*Zea Mays polysperma* Blar.) of maize is described. This variety, derived from a race rich in mutation due to the mutilation of an ancestral individual, is characterized by the occurrence of multiple grains and other anomalies. These multiple grains are compound structures, having the appearance of grains fused back to back. In the 2nd part of the article some of the anomalies isolated by American geneticists are discussed, and the author states that he has secured parallels to these, and many more, by mutilating plants. No definite statement is made as to methods employed to eliminate the effects of inbreeding while the heritable results of traumatism were being investigated.—*Paul Weatherwax.*

8724. Blaringhem, L. **Sur un hybride de Dianthus Carophyllus L. × Seguieri Chaix. [A hybrid of D. Carophyllus × Seguieri.]** Bull. Soc. Bot. France 69: 548–555. *1 fig.* 1922.—From a cross of *D. Carophyllus* × *D. Seguieri*, 47 F_1 plants were obtained and studied in detail. Full descriptions of parents and hybrid are given. The author concludes that, for the most part, dominant superficial characters of the ♂ parent are exhibited by the hybrid and that characteristic features of organization, assimilation and transpiration are for the most part derived from the ♀ parent. The hybrids were prevailingly uniform except for sex. Most of the plants were females like the mother, but a few produced hermaphrodite flowers. Pollen formation in the latter was imperfect, and all plants produced large numbers of empty seed.—*R. E. Clausen.*

8725. Brainerd, E. **Some natural violet hybrids of North America.** Vermont Agric. Exp. Sta. Bull. 239. *1–205. Illus.* 1924.—Eighty-two natural hybrids involving 30 species of *Viola* are described. The F_2 generation of a number of these has been grown and characteristic segregation is noted. Several characters which behave as simple Mendelian recessives are reported. It is concluded that the limit of hybridization in this genus is set only by the lack of co-habitation of the different species.—*P. C. Mangelsdorf.*

8726. Bremer, G. **The cytology of the sugar-cane.** Genetica 6: 497–525. *Fig. 1–20.* 1924.—Earlier articles by the author reported different chromosome numbers for the original forms of *Saccharum.* The present article uses chromosome numbers in cultivated sugar-cane varieties as a means of relating them to their probable ancestors. Four cultivated kinds (SW 3, Sw 111, DI 52 and EK_2) possess 40 chromosomes in the haploid phase and the assumption is that the parents, both ♀ and ♂, are varieties of *Saccharum officinarum.* Two other kinds (*100 POJ* and *Koesoemo*) possess 89/2 and 93/2 chromosomes in the haploid phases. The ♀ parents were *Bandjarmassin hitam* and *Djamprok* respectively, both varieties of *S. officinarum;* the ♂ parent of both is undoubtedly Loethers, a variety with very pronounced hybrid characteristics and possessing 98/2 or 99/2 chromosomes in the haploid phase. The 4 extra chromosomes of *Koesoemo* can be attributed to supernumerary chromosomes in the egg or pollen grains from which it originated. Probably Loethers is a hybrid between *S. officinarum* and some unknown variety with a different chromosome number. The peculiar chromosome number in F_1 plants of the cross, *S. officinarum* × *S. spontaneum* is puzzling and can be explained only by some irregularity in the early division of the fertilized egg. Incomplete reduction divisions characterize all sugar-cane varieties studied and there probably exists a relation between irregular reduction and sterility. Both are strongly influenced by unfavorable growth conditions.—*A. E. Longley.*

8727. Brierley, W. B. **Discussion on "The relation of plant pathology to genetics."** Rept. Internat. Bot. Conference, London, July, 1924. *P. 111–119.* 1924.—(For abstract see this issue, Entry 8720.)

8728. Brunelli, Gustavo. **The improvement of races of agricultural plants and live stock and modern genetics.** Internat. Rev. Sci. and Pract. Agric. n.s. 2: 523–553. 1924.—This article, written by the higher technical inspector of the Ministry of National Economy, attempts to place in review the majority of the ideas in genetics which have appeared during the past 25 years. Mendel's law does not apply to "unisexual crosses" which are crosses between mutants, such crosses being distinguished by a difference in number of qualities in the 2 parents. Biotypes and genotypes are treated as synonomous with "pure lines." "Despite the convinced Mendelians . . . . the author is convinced that crossing-over does not exist and is a mere illusion." Despite this it should not be assumed that chromosomes have no influence upon the phenomena of heredity. The laws of Mendel, in spite of very numerous exceptions, have still to be taken into account.—A brief outline is suggested for international collaboration leading to scientific and economic advances in genetics and breeding.—*L. R. Waldron.*

8729. Buller, A. H. Reginald. **Experiments on sex with mushrooms and toadstools: A report of the work of Irene Mounce, William F. Hanna and Dorothy E. Newton.** (Abstract.) Phytopathology 15: 302. 1925.

8730. C., F. A. E. **On being well born.** [Rev. of: Castle, W. E. **Genetics and eugenics: a textbook for students of biology and a reference book for animal and plant breeders.** *3d. ed. viii + 434 p. 60 pl.* Harvard Univ. Press: Cambridge, Massachusetts; Oxford Univ. Press: London, 1924. (See Bot. Absts. 14, Entry 2556.)] Nature 115: 489–490. 1925.

8731. Carothers, E. Eleanor. **Genetical behavior of heteromorphic homologous chromosomes of Circotettix (Orthoptera).** Jour. Morph. 35: 457–483. *Pl. 1–5.* 1921.—*Circotettix verruculatus* breeds easily in captivity and has, among its 21 chromosomes, 3 pairs of homologues (numbers 1, 7, 8) which differ from each other and from the remainder of the complex so as to be easily identified. Individual matings were made involving virgin females. After eggs had been laid both parents were killed and their gonads fixed. The gonads of sons were likewise fixed and studied in connection with parental complexes. Forty wild males were examined in order to find the normal frequency of any given condition for all the chromosomes of each pair studied. In the 28 males from 5 crosses made in the laboratory there were in all 168 chromosomes studied (2 × 3 × 28). These differed from the wild in such a way that 22 shifts of fiber attachments would be necessary to make them alike. Not a single offspring varied in its chromosome constitution beyond the limits to be expected from a combination of gametes of its parents. Any given chromosome therefore reappeared in the progeny in the same form that it possessed when it went into the parental gamete. The author believes these data are sufficient to establish the constancy of point of fiber attachment from parent to offspring for this group and to lay the basis for further work in the assumption that structural variations in chromosomes are correlated with characters in such a way that it will be possible to tell what the chromosomal constitution of the wild individual is in regard to a given pair, from an external study of the animal.—*Anna R. Whiting.*

8732. Castle, W. E. **Continuation of experimental studies of heredity in small mammals.** Carnegie Inst. Washington Year Book. 23: 226. 1924.—This paper discusses continued linkage studies in rabbits, rats and mice. Two independent linkage systems were found in rabbits: (1) English spotting, Dutch spotting and Angora coat; (2) a system showing 40% crossing over is mentioned but not announced in detail.—*E. C. MacDowell.*

8733. Castle, W. E. **On the occurrence in rabbits of linkage in inheritance between albinism and brown pigmentation.** Proc. Nat. Acad. Sci. 10: 486–488. 1924.—Brown pigmentation in rabbits is recessive to black, and Himalayan albinism is recessive to full color. Individuals heterozygous for brown pigmentation and albinism backcrossed to the double recessive gave a total of 309 offspring of which 127 or 41.1% were crossovers. The deviation of 8.9% from the 50% expected when no linkage occurs is 4.6 times the probable error.—"The notable thing about the case is the looseness of the linkage. In cases of linkage previously demonstrated in mammals, linkage is relatively close, less than 20% of crossing over being found. Here it is more than twice that amount. . . . . On account of the small size of mammalian chromosomes, loose linkages are not to be expected among mammals, on the chromosome hypothesis. What the cytological conditions are which are involved in this case, we can at present only conjecture."—*A. J. Mangelsdorf.*

8734. Castle, W. E. **The hare-rabbit, a study in evolution by hybridization.** Amer. Nat. 59: 280–283. 1925.—Attention is called to a paper by J. Yamane and T. Egashira, in Dobitsugaku Zasshi 36: 1924, published by the Zoological Society of Japan. These authors were unable to get wild hares and rabbits to mate naturally and could not obtain fertilization by artificial insemination of rabbits with hare sperm, using a technique successful in 60% of cases when rabbit sperm were used on the rabbits. This evidence is considered sufficient to show that the hare-rabbit is a myth.—*E. C. MacDowell.*

8735. Chen, Chunjen C. **Plant breeding experiment station of Peking University.** Ko-Hsueh [Science-Publ. Chinese Sci. Soc.] **9:** 1373–1381. 1925.—The article describes the organization of the plant breeding farm of Peking University at Haitien, Peking, organized under the author's supervision. The object of this farm is to improve native crops of wheat, corn, cotton, kaoliang, and millet with the idea of obtaining an early-maturing, drought-resistant, and disease-resistant variety of each crop plant. Plans and methods for these breeding projects are fully given.—*Author.*

8736. Chen, Chunjen C. **Possibilities in plant improvement in North China.** China Weekly Rev. **31:** 221–222. [Millard Publishing Co.: Shanghai, China.] 1925.—The writer discusses plant improvement as the most important economic problem of China and relates the early history of plant breeding in China. Crops like wheat, corn, cotton, sorghum, peanuts, soybean, sweet potatoes, millet, and various kinds of fruits and vegetables are mentioned as a field for plant breeding investigations in North China. Methods of procedure in plant improvement are also stated.—*Author.*

8737. Childs, R. R. **Establishing and maintaining a desirable staple in cotton.** Georgia State Coll. Agric. Bull. 288. *1–12. Pl. 1, fig. 3.* 1923.—Complaint has been made by the cotton trade that the staple of Georgia cotton (*Gossypium hirsutum*) has deteriorated. North Georgia has always had the reputation of producing cotton of high quality and good staple, and the bulletin recommends, in order that this reputation may be maintained, that the growers study the source of their cotton seed so as to obtain the best cotton of desired grades and staple lengths. The bulletin suggests that the growers should not consider so much the percentage of lint produced by a variety as the length of the staple. It recommends that in selecting seed they should secure it from plants showing high yields and good quality. It also suggests that the community can make a profit out of going into community seed production.—*T. H. McHatton.*

8738. Collins, E. J. **Genetics of sex in Funaria hygrometrica. A correction.** Jour. Genetics **15:** 244. 1925.—From experiments previously reported (Jour. Genetics 8: 139–146. 1919), the conclusion was drawn that by regeneration from antheridial branches purely ♂ plants are produced, and that therefore sex-segregation occurs in the haploid somatic tissue. This conclusion is now found erroneous. In a repetition of the experiments, overhead watering was withheld, and a succession of leafy axes with terminal antheridial heads and without sporophytes was obtained. However, close examination always showed the presence of small lateral branches bearing archegonia. If similar plants were watered from above, sporophytes appeared. These results agree with those of Correns. It is concluded, therefore, that cultures derived from haploid tissues associated with the ♂ or ♀ reproductive cells of this monoecious moss are alike in that the monoecious condition is reproduced.—*C. E. Allen.*

8739. Dahlgren, K. V. Ossian. **Zwillinge, durch Spalten des Samens experimental hervorgerufen. [Twins, experimentally produced through splitting of seed.]** Svensk. Bot. Tidskr. **18:** 492–501. *7 fig.* 1924.—The author presents some notes on his experiments with splitting of seed of *Pisum sativum* and *Helianthus annuus* and germination of the halves. The development of the seedlings from these halves is described. The growth of the seedlings of the former species is at first somewhat retarded, the radicle is spirally bent and the stem somewhat tortuous, but later quite normal individuals are developed. Halved seed of *Helianthus* show a similar growth; divided into 4 parts, they grew out finally into normal individuals, though rather slowly. Such plants, produced through halving of seed, may be regarded as a form of twins.—*O. Heilborn.*

8740. Detlefsen, J. A. **The linkage of dark-eye and color in mice.** Genetics **10:** 17–32. 1925.—New data on the linkage of dark-eye and color give crossover values based on repulsion 15.49% (2,544 offspring), on coupling 7.64% (1,964 offspring). The data of all previous investigators has been tabulated and summarized with a revised method for calculating the probable errors. No significant sex difference was found in coupling experiments; in repulsion experiments only 1 series shows a significant sex difference.—*E. C. MacDowell.*

8741. Diakonov, D. M. **Experimental and biometrical investigations on dimorphic variability of Forficula.** Jour. Genetics **15:** 201–232. 1925.—The bimodal distribution of the length of forceps of the ♂ of a species of earwig is described in biometric terms. Breeding experiments were inconclusive. The author points out that the dimorphism is not necessarily genetic, but may be a consequence of the instability of a developmental reaction.—*Sewall Wright.*

8742. East, E. M., and A. J. Mangelsdorf. **A new interpretation of the hereditary behavior of self-sterile plants.** Proc. Nat. Acad. Sci. [U. S.] **11**: 166–171. 1925.—Self-sterility in *Nicotiana alata, N. forgetiana* and their hybrids is inherited in a definite fashion. The progeny of a cross between 2 self-sterile individuals consists of a small number of sterility classes, each member of a given class being reciprocally sterile with every other member of that class; but reciprocally fertile with members of other classes.—Three such classes were present in the populations studied. When members of 2 different classes were crossed, the progeny consisted of 2 of the 3 classes in equal numbers, the class of the ♀ parent being always absent in the progeny. Thus Class X plants pollinated either by Class Y or by Class Z gave progenies consisting of equal numbers of Y and Z, Class X being always absent in the progeny when a Class X plant is used as the ♀ parent. The other 2 classes when used as females showed an exactly analogous behavior. These results are explained by assuming the action of 3 allelomorphic sterility factors, S_1, S_2 and S_3. Class $X = S_1S_3$, Class $Y = S_1S_2$ and Class $Z = S_2S_3$. A plant affords stimulus only to pollen bearing sterility factors other than its own. Thus a Class Z plant, (S_2S_3), affords stimulus only to gametes carrying factors other than S_2 and S_3. When such a plant is pollinated with pollen from a Class X plant, (S_1S_3), only the S_1 pollen is stimulated and functions, and the resulting progeny is composed, therefore, of S_1S_2 (Class Y) and S_1S_3 (Class X) in equal numbers. The results of selfing (accomplished by pollinating in the young bud) bear out the hypothesis. Class Y, (S_1S_2), selfed gives progenies consisting of S_1S_1, S_1S_2, and S_2S_2. The homozygous classes show the behavior to be expected from their constitution. Thus members of Class S_1S_1 are fertile as females with all classes except their own, but are sterile as males with Class X (S_1S_3) and Class Y (S_1S_2) as well as with their own class. Class Z, (S_2S_3), selfed gives progenies consisting of S_2S_2 and S_2S_3. Class X, (S_1S_3), selfed gives progenies consisting of S_1S_1 and S_1S_3. The non-appearance of the expected Class S_3S_3 in the last 2 cases suggests that S_3 is a lethal in the homozygous condition.—*A. J. Mangelsdorf.*

8743. Elliott, E. A. **Lamb-raising trials, season 1924.** Agric. Gaz. New South Wales 36: 253–256. 1925.—Two hundred ewes were divided into 2 lots and each lot was crossed with Dorset Horn and Ryeland rams. In general, especially at the Bathurst farm, the Dorset Horn offspring produced more profitable returns. Tabulations of results are given.—*L. R. Waldron.*

8744. Emerson, Sterling H. **The absence of chromosome pairing during meiosis in Oenothera biennis.** Papers Michigan Acad. Sci. 4: 111–114. *Pl. 12–14.* 1925.—Contrary to the findings of Cleland, the chromosomes do not become distributed to the 2 poles in any manner such that homologous ones go to opposite poles. Sometimes 2 or more adjacent chromosomes pass to the same pole, without becoming detached from one another. The conditions are the same in both *Oenothera biennis* and its mutant, *O. sulfurea.* The latter is patroclinic in its inheritance, but the sulphur-flowered character acts as a Mendelian recessive in a cross with *O. franciscana.* In this cross, 1 pair of chromosomes pairs normally, the remainder segregating indiscriminately, as in *O. biennis.* The author suggests that in forms where no pairing of chromosomes occurs, there are no homologous chromosomes.—*Ernst A. Bessey.*

8745. Erikson, Gunnar. **Chrysanthemum-Neuheit "Rosa Monaco." [The chrysanthemum novelty "Rosa Monaco."]** Möllers Deutsch. Gärtnerzeitg. **40**: 57–58. 1925.—The color of the flowers is lilac-pink, resembling the late flowering Sax Export. The 1st flower was discovered on a 2-stemmed individual of the Monaco variety; 1 stem had the ordinary white and the other had the new pink flowers. The originator is Gunnar Erikson of Bankeberg, Sweden.—*J. C. Th. Uphof.*

8746. Feldman, Horace W. **Linkage of albino allelomorphs in rats and mice.** Genetics 9: 487–492. 1924.—Data are presented which show that the linkage between the ruby-eye and pink-eye genes in both rats (17.18 ± 0.62) and mice (17.42 ± 1.14) is not significantly different from that between albinism (an allelomorph of ruby-eye) and the pink-eye factor as given by Castle and Wachter (19.66 ± 0.26 rats; 14.63 ± 0.47 mice). In mice, females showed more frequent cross-overs. In rats, crossing over was more frequent in males but this was probably not significant. No evidence of genetic modifiers of crossing-over was found.—*E. C. MacDowell.*

8747. Finlay, G. F. **The effect of different species' lens antisera on pregnant mice and rats and their progeny.** British Jour. Exp. Biol. **1**: 201–213. 1924.—Rat, sheep and ox lens antisera from rabbits as serum animals, after giving a precipitin test for the protein of lens, were injected into mice during and previous to pregnancy, 3 doses of 0.5 to 2.0 cc. to each animal. Breeding tests showed the anti-rat sera to be very toxic; from 23 treated mothers 20 young were born and lived till their eyes could be examined. A 2nd generation of 40 mice was raised from these. All eyes were normal.—Anti-sheep and anti-ox sera (18 mice injected) were far less toxic; 35 young lived to be examined; 62 young in the 2nd generation were raised. All eyes were normal. As controls, 6 mice were injected with anti-vitreous humor (ox); these gave 28 young and in the next generation, 39. All eyes were normal. Breeding was not influenced by injections of sheep lens directly into rats and mice.—*E. C. MacDowell.*

8748. Frets, G. P. **De beteekenis van het geslacht voor de erfelijkheid van den hoofdindex. [The importance to the race of the inheritance of cephalic index.]** Genetica **6**: 526–536. 1924.—The results obtained from the study of a large number of families in which brachycephalic and dolichocephalic types of skulls occur suggest that the complicated hereditary behavior of head form in man may be due to the occurrence of sex-linked inheritance. In some crosses between the 2 types, the brachycephalic appears to be dominant, while in other crosses the dolichocephalic appears to be dominant. The coefficient of correlation between cephalic index of father and son was 0.202 ± 0.024; that between father and daughter was 0.242 ± 0.022; that between mother and daughter 0.324 ± 0.019; and that between mother and son 0.251 ± 0.022.—*H. C. McPhee.*

8749. Gaines, E. F. **The inheritance of disease resistance in wheat and oats.** Phytopathology **15**: 342–349. 1925.—The susceptibility to bunt [*Tilletia tritici*] of some 500 varieties of the bread wheats was tested and all of them were found more or less susceptible, ranging in degree from complete susceptibility to a high degree of resistance. Continued selection of smut-free heads in heavily smutted fields has failed to produce a strain more resistant than the parent variety. Study of the progeny from 21 crosses between resistant and susceptible varieties showed that Hybrid 128, Winter Fife, and Velvet Node have no heritable factors for resistance; Fortyfold and Red Russian have weak resistance; and Turkey, Alaska, and Florence have highly concentrated but varying factors for resistance. Martin, Hussar, and White Odessa were entirely immune. Crosses between the susceptible varieties produced only susceptible progeny. Intermediate varieties, when crossed, gave intermediate and susceptible offspring none of which were more resistant than the parents. When resistant were crossed with susceptible varieties most of the resultant families were susceptible, only 2% being as resistant as the resistant parent. When immune varieties were crossed with these same susceptible varieties more than 50% of the resultant families produced less than 5% of smutted heads and about 20% were immune. When immune were crossed with resistant varieties a larger percentage of immune or highly resistant families resulted. The results indicate that resistance to bunt is due to the combined effect of a number of unit factors which, altogether as in immune varieties, give dominance to this character. In studying the susceptibility of oats to covered smut [*Ustilago levis*], Texas Red, a selection from Red Rustproof, was found to be immune. Analysis of the F_3 families from crosses of this variety with 4 susceptible varieties showed immunity to be dominant. The results indicate that immunity of oats to covered smut is due to an even larger number of factors than are involved in the immunity of wheat to bunt. In so far as the data have been analyzed, immunity does not appear to be linked with any of the outstanding characters of the Red Rustproof variety.—*B. B. Higgins.*

8750. Garber, R. J., and K. S. Quisenberry. **Breeding corn for resistance to smut.** Jour. Amer. Soc. Agron. **17**: 132–140. 1925.—The life history of corn smut (*Ustilago zeae*) is such as practically to preclude the possibility of controlling the disease by seed treatment or by cultural practices. The disease is best combatted by the production of smut-resistant varieties of corn. This is accomplished by isolating smut resistant strains of maize by continued self-fertilization and then combining the resistant strains by hybridization.—*F. M. Schertz.*

8751. Guyer, M. F. **Soma and germ.** Amer. Nat. **59**: 97–114. 1925.—The author believes that the theory of germinal continuity does not adequately account for genetic change. Environment must be important in initiating or at least in conditioning changes. The great problem is how the existing genes have been incorporated in the primitive protoplasm. There is little direct evidence that the primordial germ cells become functional germ cells and it is possible that somatic cells retain the fundamental constitutional mechanism of the original oosperm. All may be equally affected by circulation media carrying internal secretions and antibodies. Two wholly separate lines of defective-eyed rabbits were secured by injecting into pregnant does, blood serum of fowls immunized against rabbit lens. A 3rd unrelated strain was secured by directly injecting rabbit lens into pregnant mothers who were not affected, while the offspring were. Eye defect has been inherited in 1 strain through 9 generations. Not all individuals were affected and many results have been negative. In the new method the lens of the mother is broken up in place. This results in the production of young with opaque eyes. The criticisms of Stockard, Huxley and Carr-Saunders, and Little and Bagg are answered. The author concludes that the effect of antibodies is specific and that we may have here a case of inheritance of somatic change or parallel induction.—*Anna R. Whiting.*

8752. Harrington, J. B. **The inheritance of resistance to Puccinia graminis in crosses between varieties of durum wheat.** Sci. Agric. 5: 265–288. *Illus.* 1925.—Mindum and Kubanka 8, two commercially desirable white-grained durum wheats which are susceptible to some biologic forms of stem rust under field conditions and also in the greenhouse in the seedling state, where crossed with Pentad, a red-grained durum variety which is highly rust-resistant in the field but partially susceptible in the seedling state to certain biologic rust forms.—Four biologic rust forms were used in the greenhouse study and the parents in the Mindum-Pentad cross reacted in a reciprocal manner to the biologic forms 1 and 34. The inheritance of manner of reaction to biologic forms 1 and 34 is dependent on factors located in different loci of the chromosomes. In the cross between Mindum and Pentad some lines were obtained resistant to both biologic forms 1 and 34 and other lines were susceptible to both. The factors which govern resistance to form 34 were the same apparently as those for resistance to form 21.—White-grained lines were obtained which, under field conditions in an artifically induced rust epidemic, were as resistant as Pentad, and certain of the lines appeared promising. There appeared to be a slight linkage between the inherited factors which govern resistance under field conditions and height, erectness of plant and time of heading.—Reaction to rust was found to be inherited in the same manner as other characters. Several genetic factors were involved and environmental conditions modified rust infection.—*H. K. Hayes.*

8753. Harvey, F. H. **Egg-laying tests at Hawkesbury Agricultural College. Twenty-third year's results, 1924–25.** Agric. Gaz. New South Wales 36: 361–373. *13 fig.* 1925.—Competitions were limited to pullets between 7 and 12 months and pens were allotted to 4 sections, open and standard, light and heavy breeds. The grand champion prize was awarded to a group of 6 Black Orpingtons laying eggs of the greatest market value. The maximum number of eggs laid by 1 individual, also a Black Orpington, was 330. The maximum number of eggs laid by an individual of a light breed (White Leghorn) was 298. The article contains extensive tabular data relative to this and preceding competitions.—*L. R. Waldron.*

8754. Hayes, H. K., and S. E. Clarke. **Selection in self-fertilized lines as a means of improving timothy.** Sci. Agric. 5: 313–317. *Illus.* 1925.—In timothy the average seed-setting per head of 41 plants, which represented different apparent abilities to set seed under conditions of self-pollination, was determined in 1923. The average seed-setting under conditions of controlled self-pollination, as determined from several plants for each progeny of the 41 selected parent plants, was determined in 1924. A correlation coefficeint of 0.829 ± 0.033 was obtained for seed setting under these 2 conditions for the 41 lines. This very significant correlation indicates that seed setting under conditions of self-pollination is probably due to genetic causes.—Self-fertilization in timothy does not lead to as great reduction in vigor as has been observed in maize. Some selfed lines yielded less and others considerably more than the average for the commercial variety.—*H. K. Hayes.*

8755. Huxley, J. S., and A. M. Carr-Saunders. **Absence of prenatal effects of lens-antibodies in rabbits.** British Jour. Exp. Biol. 1: 215–248. 1924.—Preparations of rabbit and ox lens were injected into 30 fowls; the presence of antibodies reacting with lens was demonstrated in injected fowls and not in others by precipitin tests. Anti-lens sera were injected into 29 rabbits, supposedly pregnant. No young were found for 12 does; the other 17 gave 57 young. The only abnormalities found among these were a distorted skull and a lens which exhibited a pyriform opacity some hours after death.—Three does were treated directly with rabbit lens and 9 with ox lens. Precipitin tests did not certainly establish the presence of a lens antibody; 17 normal young were obtained from these treated mothers.—The article includes 12 pages of tables and a detailed account of the technique. Methods and results are compared in detail with those of Guyer, with the conclusion that seriological induction of hereditary modifications is not proved.—*E. C. MacDowell.*

8756. Ikeno, S. **Ein Vererbungsversuch über die Grannen bei Gerste. A genetic investigation of beards in barley.** Japanese Jour. Bot. 2: 189–207. *26 fig.* 1924.—In a cross between the 6-rowed entirely bearded variety Kinukawa and the less typical 6-rowed variety Nogenasi, the F_1 individuals had the middle florets long awned while the side florets were merely awn-pointed or at best had very short awns. The F_1 and later phenotypes are explained by assuming the awned parent to possess 2 dominant factors for the awned condition, A and E, with cumulative values. The awnless parent lacks these factors but carries a dominant factor, I, inhibiting awn formation on the lateral florets. An individual with entirely recessive characters is characterized by very short awns on both middle and lateral florets. Five crosses were made between individuals presumed to lack the inhibiting factor but supposed to carry either A or E. Two of these showed an increase in awn length, indicating the parents to carry A and E, respectively, while 3 showed no awn length increase. With II present and with either AA or EE present, 2 phenotypes are distinguishable. This was confirmed by crossing. Certain heterozygotic phenotypes were much in excess of expectancy. This is explained by differential pollen tube growth made by dissimilar gametes, like that found in *Oenothera* and *Rumex*.—*L. R. Waldron.*

8757. Ikeno, S. **Studien über die mutative Entstehung eines "intermedium"-Typus bei Gerste. [Studies upon the mutative origin of an intermedium-type in barley.]** Zeitschr. Indukt. Abstamm.- u. Vererb. **37**: 210–228. *Fig. 1–3.* 1925.—One plant of the intermedium type was discovered in an F_3 generation of hybrids in which both parents were 6-rowed. No intermediums were found among 250 F_2 plants of this cross. The off type was traced to an F_2 plant which was normal 6-rowed. The intermedium type behaved as a dominant when crossed with 6-rowed. The assumption that this intermedium type arose through mutation is well supported by experimental evidence.—*Fred Griffee.*

8758. Jenkin, T. J. **Natural crossing in wheat.** Welsh Jour. Agric. **1**: 104–110. 1925.—It has been generally considered that natural crossing in wheat rarely occurs in Britain, but the results here recorded show that in the old Welsh land variety, "Hen Gymro," an appreciable amount of intercrossing occurs even under the moist climatic conditions of West Wales. This variety is composite, several distinct ear types being included, while red and golden strawed types are also found. As usually grown, all types are found mixed. For the purpose of pure lining, 265 ears were selected, and the ear-to-row method was adopted. Nine per cent of the rows showed obvious segregation, color of glumes, hairiness of glumes and beardedness behaving in the usual way. Red and golden straw occurred in 7 lots in the ratio 3.5:1. Apart from these, odd plants showing the dominance of a pair of characters occurred in recessive lines. Twenty-four such plants occurred among 3,600, but since natural crosses in one direction only would thus be detected, the probable percentage is 1.3. Confirmatory tests were carried out. The methods closely agree with those of Garber and Quesenberry (Amer. Jour. Agron. **15**: 508–512. 1923), but the results are distinctly higher. It is suggested that in connection with natural crossing in wheat, variety is more important than climatic conditions in Britain.—*Author.*

8759. Kiesselbach, T. A., and N. F. Petersen. **The chromosome number of maize.** Genetics **10**: 80–85. *Pl. 1.* 1925.—Kuwada concluded that sweet varieties of maize are usually characterized by having 12 chromosomes and starchy varieties by having 10 as the haploid number. With 1 exception, his sweet × starchy hybrids were considered as having 10 as the haploid number of chromosomes. His results are summarized in a table. Longley reports 4 varieties of maize as having a haploid number of 10 chromosomes. All the forms studied by Kiesselbach and Petersen were found to have 10 as the haploid number. Their results are tabulated. Belling's iron-aceto-carmine method was used in staining the pollen mother cells from which their counts were made. This method is so rapid that it is easy to get plenty of material in its best stages and by its use, errors due to cutting are avoided. The authors conclude that, since such great constancy was found in the number of chromosomes in widely different types of maize, the variability of this species is probably due to factor mutations rather than to irregularity in chromosome behavior during mitosis leading to change of number.—*Dorothy I. Neff.*

8760. Kiesselbach, T. A., and N. F. Peterson. **The occurrence of starch and erythrodextrin in maize and their segregation in the pollen of hybrids.** Genetics **10**: 86–89. *Pl. 1, fig. 1–5.* 1925.—The authors dispute the claim that the segregation of erythrodextrin can be detected in the pollen of plants heterozygous for this type of endosperm.—*J. H. Kempton.*

8761. Kniep, H. **Über Fucus-Bastarde.** Flora **118/119**: 331–338. 1925.—Hybrids have been obtained from the crosses *Fucus vesiculosus* ♀ × *F. serratus* ♂ and *F. serratus* ♀ × *F. vesiculosus* ♂. The former cross had previously been made by Thuret. About 4% of the eggs of *F. vesiculosus* exposed to antherozoids of *F. serratus* germinated; whereas 100% of those exposed to antherozoids of their own species germinated. In the reverse cross, only about 2% germinated.—Hybrids were also obtained from crosses in both directions between *F. platycarpus* and *F. vesiculosus.*—The mating of *F. platycarpus* ♀ × *F. vesiculosus* ♂ meets with difficulty in the separation of the eggs and antherozoids of the former (monoecious) species. This difficulty was met (1) by a brief treatment of the mixture of eggs and antherozoids with chloral hydrate or alcohol, which rendered the antherozoids inactive without as seriously affecting the eggs; and (2) by removing the oögonia from the receptacles while immature.—None of these hybrids were kept under observation for more than a few days.—*C. E. Allen.*

8762. Koehler. [German rev. of: Bauer, Julius. **Methoden der Konstitutionsforschung. (Methods of studying the physical constitution.)** From: Handbuch der biologischen Arbeitsmethoden von E. Abderhalden. Abt. IX, Teil 3, Heft **1**: 1–34. 1923.] Arch. Rass.- u. Gesellschaftsbiol. **16**: 210–214. 1925.

8763. Koehler. [German rev. of: Haecker, V. **Methoden der Vererbungsforschung beim Menschen. (Methods of conducting investigations on human heredity.)** From: Handbuch der biologischen Arbeitsmethoden von E. Abderhalden. Abt. IX, Teil 3, Heft **1**: 93–192. 1923.] Arch. Rass.- u. Gesellschaftsbiol. **16**: 210–214. 1925.

8764. Koehler. [German rev. of: Kammerer, P. **Methoden der experimentellen Variationsforschung. (Methods of experimental investigations of variations.)** From: Handbuch der biologischen Arbeitsmethoden von E. Abderhalden. Abt. IX, Teil 3, Heft **1**: 65–92. 1923.] Arch. Rass.- u. Gesellschaftsbiol. **16**: 210–214. 1925.

8765. Koehler. [German rev. of: Kammerer, P. **Methoden zur Erforschung der Vererbung erworbener Eigenschaften. (Methods of investigation of the inheritance of acquired characters.)** From: Handbuch der biologischen Arbeitsmethoden von E. Abderhalden. Abt. IX, Teil 3, Heft **1**: 35–64. 1923.] Arch. Rass.- u. Gesellschaftsbiol. **16**: 210–214. 1925.

8766. Koehler. [German rev. of: Sommer, R. **Die Methoden der Familienforschung. (Methods of studying family genealogy.)** From: Handbuch der biologischen Arbeitsmethoden von E. Abderhalden. Abt. IX, Teil 3, Heft **1**: 193–210. 1923.] Arch. Rass.- u. Gesellschaftsbiol. **16**: 210–214. 1925.

8767. Koltzoff, N. **Experimental biology and the work of the Moscow Institute.** Science **59**: 497–502. 1924.—The work of the Moscow institute includes cytology, biochemistry, physiology, behavior, genetics and eugenics. Investigations with the domestic fowl have involved 40 genes. Three of these, *suke, trage* and *tuge,* are sex-linked with a high percentage of crossing-over. Slight linkages between factors for crest and frizzling and between Y-comb and blue coloration are also indicated. The number of chromosomes is found to be 16. Males heterozygous for 2 sex-linked genes show occasional feathers which apparently lack these genes. Irregularities of mitotic division and disappearance of the corresponding chromosomes are suggested as explanation. A Russian species of the fruit fly, *Drosophila funebris,* has given rise to 6 mutations, most of which cannot be identified with those of *D. melanogaster.* Investigations on the chemical hereditary properties of blood have shown that the catalase content of blood varies greatly among different individuals but is largely independent of external influences. Guinea pigs fall into 4 groups with regard to catalase index and these groups are determined by heredity. Three similar hereditary groups have also been established in the fowl and others are indicated in cattle, sheep and human beings. With regard to agglutination of human blood, the 4 well-known hereditary groups have been found. The distribution of these groups is different in Russians and Jews and in subjects suffering from phthisis, as compared to normals. Subjects in Group IV apparently possess a degree of immunity. Haemagglutination has been found in fowls and cattle and autoagglutination in horses and yaks.—*P. C Mangelsdorf.*

8768. Krantz, F. A. **On the relative value of certain methods of potato breeding.** Proc. 11th Ann. Meeting Potato Assoc. America **1924**: 40–44. 1925.—The author notes that more than 30 years have elapsed without any notable improvement in the standard commercial varieties of the potato. The russet types of the Rural and Burbank are stated to have appeared without premeditated effort, their occurrence being fortuitous and their origin unknown. Potato breeding is divided into 2 classes: (1) That based on the variations occurring through mutations within the clone or variety; and (2) that based on the variations arising through sexual breeding. The author shows that most of our present commercial varieties have been developed from seed. The paucity of results secured from clonal selection as a method of potato improvement is emphasized by the statement that the published experimental evidence on clonal selection would not justify the plant breeder or the grower in its use as a means of producing better varieties than those now existing.—In the discussion of clonal selection methods the author gives 5 reasons for differences in yield between seed stocks obtained from various growers when grown for comparative purposes: (1) Varying amounts of disease present; (2) lack of uniformity in storage conditions; (3) physiological differences in the tubers due to variations in the growth conditions; (4) soil heterogeneity in the test plot and (5) hereditary differences. Mutations are believed to be too infrequent to be of any value to the potato breeder. In sexual breeding the difficulties involved in varietal crossing are fully recognized and inbreeding is suggested as a possible means of obtaining better parents which have viable pollen. Inbreeding was found to slightly reduce the vigor of resultant seedlings. Homozygous parental material is suggested for facilitating breeding work. A critical survey of the methods of breeding employed during the past 30 years seems to justify the statement that American varieties of potatoes owe their origin primarily to sexual breeding. Somatic or vegetative variations are regarded as of dubious value as far as permanent hereditary improvement is concerned.—*W. Stuart.*

8769. Krantz, F. A., and A. G. Tolaas. **Variations in yield between seed stocks of a variety.** Proc. 11th Ann. Meeting Potato Assoc. America **1924**: 45–48. 1925.—Three possible causes are suggested which might account for variations in yield between seed stocks of a given variety: (1) Physiological differences in the seed stock brought about by variable growing conditions; (2) soil heterogeneity in the test plot; and (3) hereditary differences in the seed stocks. Chemical determinations of the nitrogen and dry matter content of tubers from different stocks showed no relation to yield. A 3 years' study by Krantz of the relation of tuber shape to yield gave no indication of a correlation between tuber shape and productivity. Soil variation was found to be an important factor in causing yield variations. The variations in yield due to soil heterogeneity left little if any variation to be accounted for by the 3rd factor—hereditary differences in the seed stocks. In the 6 varieties studied, the authors failed to find any stocks that were consistently high or low yielders and their conclusions were that if hereditary differences in productivity do exist between seed stocks they are too small to be of commercial importance.—*W. Stuart.*

8770. Laplaud, M., and A. Garnier. **La masculinité et le féminité dans l'espèce ovine. [Maleness and femaleness in sheep.]** Rev. Zootech. [Paris] 3: 164–168; 4: 256–265. 1924.—This is a study of the sex ratio in a flock of Southdown sheep, for which records were available for 18 consecutive years. A total of 860 males and 870 females was produced, or 49.7% males. It was found that on the average, 100 ewes produced almost exactly 100 lambs. The barrenness of 16.3% of the ewes was almost exactly compensated for by twin and triple births. There were, however, 3.1% stillborn. The variations in the sex ratio from year to year were merely such as were to be expected from chance.—*Sewall Wright.*

8771. Leith, B. D. **Sterility of rye.** Jour. Amer. Soc. Agron. 17: 129–132. 1925.—A

3-year study of 29,760 flowers in a rye field showed that approximately ⅓ were sterile. In 84,133 flowers studied, where the individual spike was covered, sterility ranged from 96% to over 99% in the different varieties or in the different years. Two questions remain to be solved: Can a high-yielding, self-fertile strain be isolated, or will high production depend on high yielding heterozygous stocks?—*F. M. Schertz.*

8772. McCracken, Isabel. **Studies in silkworm bionomics.** Carnegie Inst. Washington Year Book **23**: 230–231. 1924.—A statement of problems under investigation on life span, irregularities in hatching, moulting, cocooning and in color relations of eggs, blood and cocoons.—*E. C. MacDowell.*

8773. Metz, Charles W. **The cellular basis of inheritance.** Arch. Neurology and Psychiatry **13**: 26–36. *Fig. 1–8.* 1925.—The history of the chromosomes is traced from the fertilization of the egg throughout the life cycle, using a species of the genus *Drosophila* as a typical example. Sex chromosomes are described. From all the evidence furnished by many workers, the author believes that the "sex chromosome is the primary agent in sex determination in most animals." Sex-linked inheritance and crossing-over are discussed from both a genetic and a cytological point of view. A figure from Weinrich's study of the structure of the chromosome in the grasshopper is given, with discussion.—*Dorothy I. Neff.*

8774. Meunissier, A. **Un jasmin hybride.** Parfum. Mod. **18**: 96–97. *Illus.* 1925.

8775. Myers, C. H. **How to improve the yield and quality of seed potatoes by selection and to maintain such improvement.** Proc. 11th Ann. Meeting Potato Assoc. America **1924**: 5–14. 1925.—This paper deals mainly with the question of yield. With respect to the efficacy of selection, the author expresses belief in the possibility of isolating higher yielding strains by this method. Three causes are suggested for the failure of some investigators to secure satisfactory results from selection; (1) The effect of diseases; (2) a misconception of the function of selection; and (3) inadequate methods of testing the value of selection. The question, "What can we expect to accomplish by selection of potatoes?" is answered or discussed under the following headings: Selection a process of isolation; differentiation between variety and strain; the nature and frequency of bud variation in potatoes; difficulties of differentiating between strains; permanency of strains isolated by selection; disease must be guarded against; mutation may cause changes; selection should be continued from year to year; who should do hill-unit selection; method to be used in selection; and limits of selection. Under the sub-heading, "Difficulties of differentiating between strains," data are given in Table I with respect to the length, width, thickness, weight and number of tubers per hill occurring with certain tuber line selections, in order to show that definite measurable deviations were observed. In Table II data are presented showing a comparison of the average results of 3 years' tuber line selection with that of the checks. The average gain in yield over the check plots was at the rate of 48.1 bushels per acre.—*W. Stuart.*

8776. Nielsen, Niels. **Chromosome numbers in the genus Hypericum.** Hereditas **5**: 378–382. *1 fig.* 1924.—The following species of the genus *Hypericum* have the following haploid chromosome numbers: *H. Ascyron* L. 9, *H. Androsaemum* L. 20, *H. hircinum* L. 20, *H. inodorum* Willd. 20, *H. coris* L. 9, *H. polyphyllum* Boiss. et Bal. 9, *H. hirsutum* L. 9, *H. maculatum* Crtz. 8, *H. acutum* Moench. 8, *H. montanum* L. 8, *H. tomentosum* L. 8, *H. perforatum* L. 16, *H. origanifolium* Willd. 9, *H. orientale* L. 8, *H. rumelicum* Boiss. 7, and *H. prolificum* L. 9. The author calls attention to the rule applying to many genera and families that chromosome numbers are terms in an arithmetical series. In this genus no fundamental number is applicable nor is it probable that there exists 3 series with the fundamental numbers 4, 7 and 9.—*A. E. Longley.*

8777. Orton, J. H. **Sex change and breeding in the native oyster, O. edulis.** Nature **114**: 191–192. 1924.—By rearing oysters in cages and making periodic observations of their sex nature it is shown that a given oyster may be a functional ♂ at least twice during a summer, but no evidence of the occurrence of femaleness twice in one summer has yet been secured. Female-functioning oysters normally change into males at about the period of the extrusion of the ova. It is possible, however, that stimuli other than spawning may cause the change from ♀ to ♂. The proximal cause of the change from ♂ to ♀ is still to be found. It is suggested that the accumulation of reserve materials such as glycogen may be an important factor.—*Lloyd Ackerman.*

8778. Parkes, A. S. **Studies on the sex-ratio and related phenomena. 1. Foetal retrogression in mice.** Proc. Roy. Soc. London B 95: 551–558. *1 fig.* 1924.—Normal retrogression based on 82 corpora lutea is given as 10.8% of full-time foetuses. This was raised to 17.6% (4 litters) when the pregnancy immediately followed parturition and the young of the preceding litter were nursed less than 6 days. If the young were nursed 6 days or more the retrogression was found to be 23.1% (4 litters). In these 3 classes the sex ratio dropped from 118 (normal) to 80.4 (92 mice) and 62.1 (47 mice). Conclusion: Prenatal mortality falls preponderatingly upon ♂ foetuses.—*E. C. MacDowell.*

8779. Parkes, A. S. **Studies on the sex-ratio and related phenomena. (4) The frequencies of sex combinations in pig litters.** Biometrika 15: 373–391. *Fig. 1.* 1923.—This is a study of the distribution of the sexes within litters of each size from herd book records of Duroc-Jersey swine. A total of 2,020 litters including 60,233 young were studied. Of these 48.84% were males. There was no significant relation between size of litter and sex-ratio. The distribution of the sexes within litters of the same size did not agree well with the binomial expectation using Pearson's X^2 method. The disagreement was largely due to an excess of litters which were equally or nearly equally divided between males and females and a deficiency of litters in which one or the other sex was in marked excess, a type of disagreement which the author finds difficult to explain on a biological basis.—*Sewall Wright.*

8780. Prell, Heinrich. **Monomere und Polymere Elimination.** Genetica 6: 124–144. 1924.—The effect on Mendelian ratios of differential elimination or mortality of gametes and zygotes is discussed. Four types of elimination are recognized and examples are presented (1) Monomere gametic; (2) monomere zygotic; (3) polymere gametic; (4) polymere zygotic. The elimination of certain zygotes because of the failure of a triploid endosperm to develop is suggested as a 5th class.—*P. C. Mangelsdorf.*

8781. Richey, Frederick D., and J. G. Willier. **A statistical study of the relation between seed-ear characters and productiveness in corn.** U. S. Dept. Agric. Dept. Bull. 1321. *1–19.* 1925.—Data from ear-to-row plats in 4 varieties of corn, comprising 3,265 ears in all and extending over 47 crop years, were studied as to possible relations between productiveness and some physical characters of the seed ears. (1) Accidental variation in soil and experimental conditions was responsible for a large part, possibly 90%, of the total variation in yield. (2) From 2.5 to 6.7% of the total variation in yield in the different varieties was a function of variation in the ear characters studied. (3) On the basis of the multiple regression equations involving 7 ear characters, yield was related positively to weight of ear and length of ear and negatively to number of rows and number of kernels per row in each of the 4 varieties. Similarly, yield was related positively to butt circumference and weight of cob and negatively to tip circumference in each of 3 varieties, the relations being reversed in the 4th variety. (4) The use of weight of ear, number of rows, and number of kernels per row in a multiple regression equation gave almost as good a predicting equation in each of the varieties as the inclusion of the 4 other characters, and was the best general predicting equation involving only 3 characters. (5) Because of varietal differences, the substitution of weight of cob for weight of ear and butt circumference for number of kernels per row gave a better 3-character predicting equation in certain varieties than that mentioned under (4). (6) Selecting longer, heavier ears with proportionately heavy cobs and with relatively few rows of wide, thick kernels is warranted as a means of obtaining a supply of good seed for general planting. (7) Selection from among good seed-ears on the basis of ear characters as a method of corn breeding is not warranted.—*Frederick D. Richey.*

8782. Roberts, J. A. Fraser. **The science of genetics and the stock breeder.** Welsh Jour. Agric. 1: 38–45. 1925.—The science of genetics is likely to become increasingly useful to the breeder in 3 general directions. First, it provides an explanation of traditional procedure enabling the breeder to discard non-essential steps and to frame a policy on a scientific basis instead of by rule-of-thumb methods. Second, it holds out the hope of certainty in practical operations just as far as character analysis has proceeded. Finally, in the case of many individual problems assistance can be provided, such questions as fertility, sex-ratio and the occurrence of monstrosities offering a particularly favorable field. The essential inter-connection between genetics and physiology is emphasized.—*Author.*

8783. Schaffner, John H. **Sex determination and sex differentiation in the higher**

plants. Amer. Nat. 59: 115-127. 1925.—Inasmuch as the sporophytes of the higher plants as well as certain gametophytes of the vascular cryptogams, are indeterminate in development, excellent material is thus afforded for experimental studies in sex reversal. Staminate and intermediate plants of *Arisaema triphyllum* of normal environment grown under optimum moisture and nutritive conditions became changed to carpellate plants; the carpellate plants, at the same time, maintained their original sexual status. On the contrary, carpellate and intermediate plants were changed to staminate plants by a harsh environment. With *A. dracontium*, reversals were secured between staminate and monoecious conditions depending upon the environment. No purely carpellate plants were found. Sex reversals with *Cannabis sativa*, secured by modifying the daily illumination period, were as definitely predictable as Mendelian ratios, with proper environmental conditions. In a group of hemp plants, reversal probably occurs 1st among the weaker plants; certain of the reversals took place only after several months. With variations in illumination, one hemp plant underwent successive reversals from carpellate to staminate and return, alternating with vegetative phases. Results similar to those with hemp were secured with *Humulus Japonicus*. Pure staminate and carpellate plants of *Thalictrum dasycarpum* transplanted from the wild to a modified habitat changed to sexual intergrades. It is evident from the foregoing that allosomes in organisms can be no more than sex producing. Determination and differentiation of sex in plants is correlated with general physiological relationships rather than with the more specialized phenomena of the shiftings of factors and chromosomes and hence genetics is not the primary basis for an investigation of sexuality but is a problem that physiological ecology alone can solve.—*L. R. Waldron.*

8784. Schiemann, Elisabeth. **Zur Genetik des Sommer- und Wintertypus bei Gerste. [A contribution to the genetics of summer and winter type in barley.]** Zeitschr. Indukt. Abstamm.- u. Vererb. 37: 139–209. 1925.—A study was made of the mode of inheritance of winter versus spring habit and of winter-hardiness in crosses of winter and spring barleys. Winter varieties sown in the spring before March 21 developed normally and ripened. Plantings after March 21 resulted in some plants failing to produce heads, and from sowings after April 4 none of the winter types produced heads but all withered in the rosette stage. *Hordeum spontaneum* ripened regardless of the date of sowing when sown in the spring. F_1 hybrids between winter and spring forms developed normally, sown either in the fall or in the spring. In the F_2 generation a 3:1 ratio of spring to winter types was obtained. Winter-hardiness behaved as a rather complex character. An explanation is given on the basis of 2 factors, W_1 having twice the influence of W_2 on winter-hardiness. Barley varieties which can be grown either as winter or spring types are considered to be winter-hardy spring types. Later generations from spring sown F_2 generations produce eventually only spring types if spring sowing is continued, while later generations from winter sown F_2 produce only winter types if winter sowing is continued. This behavior is explained on the basis of the natural selection effected when one of the homozygous types is lethal. *Hordeum spontaneum* is considered as being a spring type with a winter habit. When fall sown under mild winter conditions it produces normally but is winter-killed under more severe conditions. Sown in the spring it produces heads normally. In crosses of *H. spontaneum* with spring types the F_1 plants all ripened. In F_2, 3 forms were obtained, namely; low, intermediate, and erect forms. The proportions of each of these types varied, depending upon the time of sowing. Winter-hardy types were obtained from this cross. It is suggested that winter types may have originated from crosses of wild types like *H. spontaneum* with spring types. Winter forms were also obtained from crosses in which both parents were spring types.—*Fred Griffee.*

8785. Sharp, Lester W. **The factorial interpretation of sex-determination.** La Cellule 35 (Vol. jubilaire V. Grégoire, Ire partie): 193–235. 1925.—This is a comparison of the Mendelian and metabolic theories of sex-determination, with a consideration of their reconciliation on a common basis. Representative cytological and other researches bearing on the problem of sex-determination in plants are reviewed. The principal concepts of the current Mendelian factor hypothesis are set forth, and their applicability to the case of sex is discussed. The determination of any heritable character is held to involve the establishment of a certain complement of constitutional factors affecting that character, and the interaction of these intrinsic factors with extrinsic factors during ontogenesis. Sexual conditions in various types of life cycles are interpreted in the light of this conception. It is concluded that "(1) . . . we must regard as inadequate any theory that sex-determination is due exclusively and in all cases to the same set of differential factors, whether these be genetic or environmental in nature. Any general theory applicable to all cases must account for sex-determination as the result of the interaction of two sets of factors: genetic factors, represented by the inherited physico-chemical organization of the protoplasm, and non-genetic factors, represented by the environmental conditions with which this organization is inseparably associated. These two sets of factors, which are integral parts of a single organic system producing the phenomena in question, vary in the relative proportion of their respective differential or controlling effects upon sexual differentiations in different types of organisms, and in the same organism under appropriately dissimilar conditions. (2) The evidence further indicates that the genetic factors influencing sex can at present be treated as genes of the same general nature as those held to function in the inheritance and determination of other characters; hence sex inheritance may be regarded as Mendelian in nature. (3) Disproof of conclusion 2, or even disproof of the current theory of the mechanism of Mendelian heredity in general, would not invalidate conclusion (1)."—*Author.*

8786. Shelton, J. P. **The methods of the late W. J. Farrer. With some results of his work.** Agric. Gaz. New South Wales 36: 403–413. 1925.—Extracts are given from certain of his letters relative to his attitude toward breeding for resistance to rust in wheat and in regard to his ideas relative to Mendel's law, the latter written in 1905. In spite of his using unfixed, and often F_1, hybrids for parents, his final results were in many cases successful. In a letter to Biffen he mentions securing a wheat hybrid selection distinctly earlier than either parent.—*L. R. Waldron.*

8787. Stroman, G. N. **The inheritance of certain chlorophyll characters in maize.** Genetics 9: 493–512. *Fig. 1–3.* 1925.—Three new chlorophyll disorders are described and their inheritance is noted. These are designated yellow-white, seedling zebra and white-base-leaf. The 2 former characters are visible in the seedling stage and the latter is found well developed in half grown plants. The yellow-white character has been found to depend upon 2 loosely linked factors m_1 and m_2. A single factor is responsible for seedling zebra and for white-base-leaf. The former has been given the symbol zb_2 and the latter w_2. All 3 characters are recessive to the normal form. In crosses involving m_1, m_2, and w_2 it was found that when w_2 is homozygous, complete albinism results, regardless of whether m_1 or m_2 are present. Linkage data indicate that w_2 is in the chromosome with sugary endosperm *su* and that m_1 is in the linkage group with yellow endosperm *Y.*—*J. H. Kempton.*

8788. Vandendries, R. **Recherches sur la sexualité des Basidismycètes. [Researches on the sexuality of the Basidiomycetes.]** Compt. Rend. Soc. Biol. 86: 513–515. 1922.—The author confirmed and developed M. Bensaude's conclusion on the heterothallism and sexual process of the basidiomycetes. The 7 strains of *Hypholoma fasciculare* in monosporus cultures remained sterile and produced primary mycelium only. The contrasting of each of the 7 strains with the other 6 showed that 4 of them belonged to one sex and did not produce secondary mycelia with each other. They were fertile and gave secondary mycelia when contrasted with each of the other 3 strains. The author observed the fusion of the primary mycelia.—*S. Satina.*

8789. Vavilov, N. I. **The law of homologous series in variation.** Jour. Genetics 12: 47–89. *Pl. 9–10.* 1922.—The author made an analysis of different characters found in closely related species, particularly in different cereals, and came to the conclusion that "in general, closely allied Linnean species are characterized by similar and parallel series of varieties; and, as a rule, the nearer these species are genetically, the more precise is the similarity of morphological and physiological variability. Genetically nearly related species have consequently similar series of hereditary variation." This is considered the 1st law or rule in polymorphism. As a result of comparison made between different genera, a 2nd law of polymorphism is formed, namely, "that not only genetically closely related Linnean species, but also closely allied genera display similarity in their series of phenotypical, as well as genotypical, variability." After an analysis of variability in different families is made, a 3rd law of polymorphism is formed, namely, that "whole botanical families in general are characterized by a definite cycle (series) of variability which goes similarly through all genera of the family."—Knowing a succession of varieties in 1 genus or species, the author claims that one can forecast the existence of similar forms and even similar genotypical differences in other genera or species.—Mimicry is considered by the author to be in most cases only a repetition of similar cycles of variation in different families and genera. The author compares regularities in polymorphism of plants with homologous series of organic chemistry.—*M. Demerec.*

8790. [Vavilov, N. I., and E. S. Kuznetsova.] Вавилов, Н. И., и Е. С. Кузнецова. **О генстической природе озимых и яровых растений.** **[The genetic nature of winter and spring varieties of plants.]** (With English résumé.) Известия Саратовского Селвско-Хозяйственного Института. Ann. Inst. Agron. Saratov [Russia] **1**: 17–41. *3 fig.* 1923.—In a cross between a spring and a winter wheat, the spring condition was entirely dominant. In the F_2 the ratio of spring to winter type was 10:1. From the 500 pure springs, 234 were constant but of these 36 were late spring. The 266 segregating families produced a 4:1 spring to winter ratio. While the spring parent had an average tillering of 5, certain F_2 extractives, characterized by very narrow leaves and thin straw, had maximum tillering of 2 which was strictly inherited in the F_3. Tiller number was found to be strictly correlated with length of growing period. In crossing spring barley varieties, winter forms segregated in the F_2 and F_3. Evidently spring type has not come from winter type by a simple mutation but rather spring or winter forms have been selected as desired from the primitive population containing both forms naturally. Primitive mixed groups of this sort could have come into existence by natural hybridization between phenotypically similar winter (or spring) individuals.—*L. R. Waldron.*

8791. Wallace, H. A., and G. W. Snedecor. **Correlation and machine calculation.** Iowa State College Agric. and Mech. Arts Publ. 35. *1–47.* 1925.—A presentation of methods of using calculating machines in calculating simple, multiple and partial correlation coefficients.—*Sewall Wright.*

8792. Weatherwax, P. **Anomalies in maize and its relatives. II. Many-flowered spikelets in maize.** Bull. Torrey Bot. Club. 52: 87–92. *Illus.* 1925.—The occurrence of multiple-flowered spikelets in the terminal panicle of maize is described and their morphological significance discussed. The abnormal plants had structures showing all gradations between normal staminate spikelets and almost perfect pistillate shoots. This condition has come about through a reversal of the order of development of parts along the rachilla and a meristematic reduplication of the parts in the spikelet. In extreme cases the normal 2-flowered staminate spikelet is replaced with pistillate spikelets or pairs of spikelets arranged in many rows around a cob-like axis. Although ear-like structures have been formed in this manner it does not follow that the ear is a phylogenetic descendant of the spikelet. It is pointed out that the development of the polystichous axis in the tassel, from the distichous form by meristematic duplication furnishes evidence that it is unnecessary to assume the lateral fusion of spikes to explain the origin of the ear.—*J. H. Kempton.*

8793. Wellensiek, S. J. **Het kweeken van wratziekte-immune aardappelrassen op wetenschaapelijk grondslag. [Breeding wart-disease-immune potato varieties on a scientific basis.]** Tijdschr. Plantenz. 31: 91–101. 1925.—The literature on heredity of immunity to wart-disease in the potato is discussed and some conclusions are drawn as to the breeding of immune varieties. It is not a good procedure to start from immune varieties only; susceptible parents may have a great value, depending on their genotypical composition. Stress is laid on the necessity of studying the genetic composition of valuable varieties as to immunity to wart. This knowledge will show which varieties may be used as parent plants with the greatest chance of finding a considerable number of wart-immune individuals among the offspring.—The value of extensive genetic investigation of the potato plant with regard to immunity from wart-disease is discussed.—*D. Atanasoff.*

8794. Wettstein, F. von. **Über Fragen der Geschlechtsbestimmung bei Pflanzen. [Problems of sex-determination in plants.]** Naturwissenschaften 12: 761–768. 1924.—A summary of present knowledge concerning the genetics of sex determination. The author treats separately of haplonts, including haplomonoecious and haplodioecious plants, and of diplonts, including diplomonoecious and diplodioecious forms. A distinction is drawn between phenotypic and genotypic sex-determination. Correns' notion is accepted that in haplodioecious as well as in diplodioecious plants the factor-complexes for both ♂ and ♀

characters are present in every plant; but in the addition there is a pair of factors (or factor-complexes) which are segregated in the reduction divisions, either of which makes possible the expression of the corresponding set of sex factors.—*C. E. Allen.*

8795. Whiting, Anna R. **The inheritance of sterility and of other defects induced by abnormal fertilization in the parasitic wasp, Habrobracon juglandis (Ashmead).** Genetics **10**: 33–58. *Pl. 1, fig. A–M.* 1925.—The method of inheritance in this species is sex-linkoid, since males (haploid) are normally produced from unfertilized eggs, females (diploid) from fertilized. The stocks used have come from 2 females, one taken in Lancaster, Pennsylvania, the other in Iowa City, Iowa. When black-eyed males (dominant) of Lancaster or Iowa City stocks are crossed to related orange-eyed females (recessive) some black-eyed males (patroclinous) are produced in addition to orange-eyed males expected by sex-linkoid inheritance. When black-eyed Iowa City males are crossed with orange-eyed unrelated Lancaster females no black-eyed patroclinous males are produced. Crosses involving Iowa City stocks produce a higher percentage of females and a lower percentage of patrocliny than those involving Lancaster stocks alone. Patroclinous males show a higher percentage of morphological abnormalities than other males or females, and are for the most part sterile and transmit only black. A few are mosaics, fully fertile and transmit only orange. Orange-eyed daughters of the latter are normal in morphology and fertility. Black-eyed daughters of the former are few, show a high degree of abnormality and almost complete sterility. Only one such female produced offspring, a single black-eyed male, normal in appearance and completely sterile. Sterility of patroclinous males and their daughters does not seem to be correlated with any gross internal defect. Some theories are suggested as possible explanations of the production of patroclinous males, their sterility and that of their few daughters.—*Author.*

8796. Wriedt, Chr. **Vererbungsuntersuchungen, beim Pferd.** [**Genetic studies of the horse.**] Zeitschr. Indukt. Abstamm.- u. Vererb. **37**: 88–100. 1925.—A review of the literature of the subject is indicated. Ten probable color factors are listed. *A* determines the type of gray (dominant) which fades gradually to white. *B* determines dominant roan. *C* determines the dominant piebald pattern. *D* determines a pattern found in the Pinzgauer horses, in which there are small white spots on a black ground or the reverse. *E* is found in the dun-colored wild horses. Its recessive allelomorph determines the more intense colors of bays, chestnuts and blacks. *F* is fundamental to color production. Its recessive allelomorph is responsible for true albinism. Dominance is incomplete as the red or yellow pigment of bays; chestnuts or duns are reduced to a very pale yellow in the heterozygotes. *G* makes possible the production of black pigment. Its recessive allelomorph is found in chestnuts. *H* changes black to brown or bay. *I* distinguishes bays from browns. *K* is a partially dominant factor. The homozygotes are self-white with brown or glass eyes. The heterozygotes usually show gray. This factor is found in the Frederiksborg and Herrenhausen horses. In the former, *K* appears to be linked with a lethal factor. Among other characters, breaking of the arteries in thoroughbreds behaves as a recessive. Roaring is inherited but the method is uncertain. A further study of reported genetic differences in gestation period, pacing as opposed to trotting, and enduranec of race horses is considered necessary.—*Sewall Wright.*

HORTICULTURE

F. C. Bradford, *Editor*

(See also in this issue Entries 8206, 8207, 8242, 8256, 8265, 8266, 8267, 8280, 8284, 8349, 8371, 8386, 8391, 8395, 8421, 8692, 8722, 8735, 8736, 8745, 8774, 8936, 9113, 9129, 9195, 9298, 9302, 9303, 9397, 9401, 9403, 9424, 9515, 9529, 9544, 9545, 9557, 9632, 9635, 9651, 9665, 9667)

8797. Anonymous. **Aufbereitung des Kakaos.** [**Treatment of cacao.**] Tropenpflanzer **26**: 58–59. 1923.—A review is given of drying cacao beans in vacuum, a process which was developed especially by H. Zehnter in Brazil. According to A. C. M. Rieck, natural drying in the sun is preferable to artificial drying; the latter should be used only when the beans can not be dried by the sun. Processes started during fermentation and affecting the flavor and quality of the product have not finished certain chemical actions in the beans, but these are finished during slow drying in the sun at 40–50°C. Beans die after several days, but when subjected to quick artificial drying, the chemical processes are suddenly interrupted and are therefore incomplete. In artificial drying no temperatures should be used higher than 80–100°C.; they should resemble those of sun drying as closely as possible. This vacuum drying offers the advantage that the temperature rises slowly.—*J. C. Th. Uphof.*

8798. Anonymous. **Growing by electricity.** Market Growers Jour. 34^1: 26–27. 1924.—This is a report of a 6 weeks' test on the use of the electric light on plants, conducted by the Westinghouse Lamp Company in cooperation with Peter Henderson & Co. Light hastened germination of seed of some crops and the advantage gained was maintained throughout. There was no perceptible gain in growth of beets, carrots and radishes. All plants with large leaf surface were greatly stimulated by the additional electric lighting (8 p.m. to 1 a.m.).—In tests at Columbia University favorable results were noted on Boston fern, Calla lillies, rose geraniums, etc. Plants grew taller, continued to blossom longer and were sturdier than those not receiving artificial light.—*H. C. Thompson.*

8799. Anonymous. **Hardy exotic plants suitable for the gardens of Missouri and the adjoining states.** Missouri Bot. Gard Bull. 9: 20–25. 1921.—Valuable lists of plants for rock gardens and water gardens, classified according to height, color of flowers, time of bloom, and nativity are presented.—*O. T. Wilson.*

8800. Anonymous. **Mateerzeugung in Südamerika. [Growing yerba maté in South America.]** Tropenpflanzer 24: 19–20. 1921.—Argentina consumes annually 60,000 tons of yerba maté. Considerable forests occur in Argentina, Paraguay, Uruguay and some of the southern states of Brazil. A plantation was established by Germans in Nueva Germania, Paraguay. The hard seed are stratified for 9 months in moist sand. Plants are set in the plantation when 6 months old. In 3 years a plant may produce 1 kg. of leaves; many owners take no harvest until the trees are 6 or 7 years old. Trees reach a considerable age; they are not subject to many pests. Harvest from wild trees occurs in the cold period from May to September. Leaves are dried by hot air or above a wood fire. Color and flavor of the leaves are much influenced by rain and sun.—*J. C. Th. Uphof.*

8801. Anonymous. **Watercress as a commercial crop in Illinois.** Market Growers Jour. 34^{12}: 465. 1924.

8802. Allen, W. J. **Curing the lemon.** Agric. Gaz. New South Wales 36: 252. 1925.

8803. Allen, W. J., and W. le Gay Brereton. **Experiments in the processing of passion-fruit.** Agric. Gaz. New South Wales 36: 295–296. 1925.—Passion-fruit pulp was processed under various conditions. These consisted of different temperatures, different lengths of time, and differences in sugar content. Difficulty was experienced in securing soundness of pack with 10% sugar. Processing 13-ounce cans at 180 to 190°F. for 20 minutes seemed sufficient; but with 5-pound tins, processing at 190°F. for 20 minutes was not always sufficient. There seemed to be but little difference in flavor between the 2 lots containing, respectively, 5% and no sugar.—*L. R. Waldron.*

8804. Arens, P. **Erfahrungen mit Okulation von Hevea in Niederlandisch-Indien. [Experiments in Hevea budding in Dutch East India.]** Tropenpflanzer 26: 1–4. 1923.—Good *Hevea* strains are propagated by budding. Stocks should be strong, 8–12 months-old seedlings. Buds are selected from vertical twigs and start growing in 1–7 months. Budding is done in the seed beds and is described in detail. Shoots not derived from the growing bud are removed. When the shoot derived from the bud is about 5 cm. long the plants are transplanted and treated as "stumps." Investigations and results obtained by W. Vischer are described.—*J. C. Th. Uphof.*

8805. Armbrecht. **Canna-Hybriden unten Glas. [Canna hybrids under glass.]** Möllers Deutsch. Gärtnerzeitg. 40: 61. 1925.—Cannas grow very well in the greenhouse. The following varieties are recommended: Feuersauber, Gartenschönheit, Walhalla, Herm. A. Hesse, and Generalmajor von Teichmann.—*J. C. Th. Uphof.*

8806. Armbrecht. **Pentstemon gentianoides "Pfitzers Riesen."** Möllers Deutsch. Gärtnerzeitg. 40: 61. *1 col. fig.* 1925.—When seed are sown in February or March the plants may start flowering from July until autumn. Cuttings can be made in late summer or autumn.—*J. C. Th. Uphof.*

8807. Arokiasawmy, M. **A short note on mangosteen.** Year Book Madras Agric. Dept. **1923**: 38–43. 1924.—The method of raising seedlings and cultivation of this fruit tree (*Garcinia Mangostana*) are described.—*P. S. Jivanna Rao.*

8808. Arthur, J. M. **Pruning the Ohanez and Cornichon vines.** Agric. Gaz. New South Wales **36**: 291–292. *1 fig.* 1925.—Though the Ohanez variety is generally a shy bearer, the author found that summer topping induced the production of lateral growths and a 2nd crop could be produced upon these laterals, thus augmenting the usually deficient 1st crop. When the Cornichon variety fails to set a crop, a 2nd or late crop can generally be forced by summer topping of the current canes, provided the work is done sufficiently early to afford time to produce and mature the later crop. This forcing to produce a 2nd crop has not seemed to influence adversely the production of a normal crop the season following. The 2nd crop, when produced, is usually of a quality inferior to that of the normal 1st crop.—*L. R. Waldron.*

8809. Barrett, O. W. **Frutas que debemos traer a Puerto Rico. [Fruits which should be introduced into Porto Rico.]** Rev. Agric. Puerto Rico **12**: 395–396; **13**: 25–26, 107–110. 1924.—A number of fruits including the mangosteen (*Garcinia Mangostana*), *Artocarpus odoratissimus*, akee (*Blighia sapida*), litchee (*Nephelium*), cherimoya (*Anona Cherimolia*), *Lansium domesticum, Diospyros discolor, Eugenia malaccensis, E. floribunda*, and *Averrhoa Carambola* which it is believed would be successful in Porto Rico, are described.—*John A. Stevenson.*

8810. Bates, Charles Z. **Algo sobre goma. [Notes on rubber.]** Rev. Agric. Puerto Rico **14**: 321–324. 1925.—Brief notes are given on the principal rubber-producing trees and plants of the world.—*John A. Stevenson.*

8811. Beckwith, Charles S. **Report of the cranberry substation.** New Jersey Agic. Exp. Sta. Ann. Rept. **44**: 299–313. 1923 [1924].—This presents a report on a fertility investigation with the cranberry. A tabulation of yields (1922) on plots receiving different amounts of nitrogen in the form of nitrate of soda, dried blood and a mixture of the two showed that nitrate of soda gave larger yield increases than dried blood. The combination of the two outyielded blood alone. Thirty pounds of nitrogen gave larger yields that 20 pounds. The statement is made that 20 pounds would be sufficient in most instances, the experimental area being very poor Savannah land.—Acid phosphate gave greater returns than equivalent amounts of rock phosphate. A comparison of 0, 264, 528, 792, and 1056 pounds of a fertilizer mixture consisting of 75 pounds of nitrate of soda, 75 pounds of dried blood, 300 pounds of rock phosphate and 50 pounds of sulphate of potash showed the maximum increase in yield with the 792 pound application. In a test conducted with various amounts of phosphoric acid on muck cranberry land, the maximum gain is reported on the area receiving 75 pounds of rock phosphate for the past 4 years, with an application of acid phosphate equivalent to the rock phosphate in 1919. Records for 1922 from a series of 40 plots receiving various fertilizer treatments in 1920, show decreased yields in every case except the plot receiving 15 pounds of potash.—The 1922 yields of plots on Savannah and muck bottom cranberry lands treated with various amounts of calcium and magnesium limestone show a general increase in yield, the greatest increase being recorded on the area receiving 2000 pounds of magnesium limestone in 1918 and 1919. In general, however, there was little difference between the 2 types of limestone.—The results of a spray test are reported in which the sprayed plots received Bordeaux-soap mixture, once just before bloom, once just after bloom and a 3rd application 2 weeks later. All of the crop on the unsprayed plots rotted by Aug. 1. The sprayed plots showed little rot at this time but by Aug. 20 they were affected and not enough fruit was left by September to pay for picking.—*Wm. H. Martin.*

8812. Besoke, G. **Wiederstandfähige Cyclamen. [Resistant Cyclamen.]** Möllers Deutsch. Gärtnerzeitg. **40**: 130–131. 1925.—Cyclamens receiving too much N and grown in too hot an environment react unfavorably to every change of temperature. In order to get cold-resistant plants, the writer sows in March and transplants in frames; at each transplanting the plants are placed in a colder environment, which keeps them compact. Much air and little shade are given in summer; this treatment aids in hardening off the seedlings. Plants are kept till flowering time at 1–2°C. in winter. The condition of the greenhouses contributes much to the development of the plants. Ernst Benary in Erfurt, who grows Cyclamen for seed on a large scale, selects plants with broad, rounded off petals and strong but not too long flower stalks.—*J. C. Th. Uphof.*

8813. Brown, W. S. **The blackcap industry of the Northwest.** Amer. Fruit Grower 45^5: 4, 14; 45^6: 12, 32, 34. *Illus.* 1925.—This is a general descriptive account of the blackcap raspberry industry of the Pacific Northwest, with special reference to soils, cultivation, irrigation fertilizers, pruning, training, insect pests and diseases, harvesting and handling, yields, markets and varieties. Among the diseases, anthracnose, crown gall and such systemic diseases as mosaic, bramble streak or eastern blue stem, and leaf curl are discussed and methods for their control given.—*Arthur S. Rhoads.*

8814. Busse, W. **Ursachen und Wirkungen bei der Aufbereitung des Kakaos. [Causes and effects in treatment of cacao.]** Tropenpflanzer 27: 69–93. 1924.—Cacao beans are subjected to 2 different kinds of fermentation processes often called "outer" and "inner" fermentation. The former is effected by yeast and bacteria; the latter by enzymes. Alcoholic fermentation is caused by the decomposition of the sugar in the slimy envelope of the cacao seed. The progress, intensity, time and result of this fermentation depend on (1) kind and quantity of the sugar, (2) presence of substances of food value for the microörganisms, (3) quantity, species and activity of these microörganisms, (4) weather conditions, (5) technical construction and conduct of fermentation activities, and (6) presence and combating of harmful organisms. Fermentation organisms belong to different species; they are distributed by air, insects, hands of laborers, etc.; in the West Indies, especially, *Drosophila melanogaster* is a means of distribution. Preyer isolated *Saccharomyces Theobromae* as one of the most effective yeasts. The writer reviews in details the work of Chevalier, Loew, Rieck, Fickenday and others. Failure of fermentation is often caused through unripe fruits. A description of drying is presented.—*J. C. Th. Uphof.*

8815. Butler, M. D. **About horseradish.** Market Growers Jour. 34^5: 196–197. 1924.—This is a discussion of methods of growing, harvesting and marketing.—*H. C. Thompson.*

8816. Campbell, H. C. **Providing cold storage for apples.** Amer. Fruit Grower 45^6: 8, 17. 1925.—Notes are given on various structural details in the construction of cold storage plants for apples.—*Arthur S. Rhoads.*

8817. Chace, E. M., C. G. Church, and F. E. Denny. **Relation between the composition of California cantaloupes and their commercial maturity.** U. S. Dept. Agric. Dept. Bull. 1250. *1–26. Fig. 1–2.* 1924.—The soluble solids content, the refractive index, and the sucrose content of the juice of cantaloupes increase and the percentage of starch in the seed decreases as the melons ripen. The juice of melons which are mature when picked has a specific gravity of at least 1.040, equivalent to 10% solids, a refractive index of at least 55 on the immersion refractometer, and a sucrose content of not less than 4.5%. The seed of such melons contain less than 0.5% of starch. Melons gain in flavor, but not in sweetness, after being picked. On storage at low temperatures such as are found in iced cars, the melons change but little, so that their composition during and immediately after storage indicates their condition when picked. After softening, if kept at ordinary temperatures there is a slight loss in sucrose. After picking and storage, there is a loss of starch in the seed.—*E. M. Chace.*

8818. Chen, Chunjen C. **[A nursery list of Peking ornamental plants.]** Tsing-Hua-Hsueh-Pao [Tsing Hua Journal-Publ., Tsing Hua College.] 2: 477–526. 1925.—This is a list, alphabetically arranged, of 170 ornamental plants commonly cultivated in the vicinity of Peking, with full indications under each of its propagation, culture, and special uses, as well as descriptions of flowers and the height of plants. For each plant both the Chinese standard name and the English scientific name and also the name of the family to which it belongs, are given. An index of Chinese names is also appended.—*Chunjen C. Chen.*

8819. Clark, A. B. **Quality seed for the market vegetable grower.** Market Growers Jour. 34: 214, 215. 1924.

8820. Connors, C. H. **Cultural studies with Hydrangeas.** New Jersey Agric. Exp. Sta. Ann. Rept. 44: 77–80. 1923 [1924].—In soils having an initial pH value of 5.6 the color of the flowers was blue; in the same soil, with an application of 10,000 pounds of ground limestone the bloom was pink, while where 400 pounds was added the blooms were intermediate in color. In another experiment, soil containing 10 and 20% manure gave blue, while the addition of 40% manure resulted in intermediate colors. The initial pH value of this soil was 5.6; 4 months later the H-ion concentration of the soil containing 10, 20 and 40% manure was 5.8, 6.0 and 6.4, respectively. The addition of iron filings, ferrous sulphate and potash alum to soils in addition to sulphuric acid in a M/40 dilution resulted in blue flowers. In every case the addition of these substances to the soil was accompanied by an increase in H-ion concentration, which is held to be responsible for the production of the blue blooms.—*Wm. H. Martin.*

8821. Connors, C. H. **Peach breeding.** New Jersey Agric. Exp. Sta. Ann. Rept. **44:** 81–85. 1922 [1924].—Corroborative evidence of the male sterility of the J. H. Hale peach was obtained. On a branch bearing 746 blossoms only 1 fruit set. This is taken to be evidence that the variety J. H. Hale must be set in the orchard in such a way that cross-pollination is possible.—*Wm. H. Martin.*

8822. Cooper, J. R. **Grape growing in the Ozarks.** Amer. Fruit Grower 45^7: 5, 11. *Illus.* 1925.—This is a general descriptive account of grape growing in the Ozarks with special reference to varieties, soils, cultivation, fertilizers, pruning, and spraying.—*Arthur S. Rhoads.*

8823. Dittmann, George. **Kultur der Freesia refracta alba.** Möllers Deutsch. Gärtnerzeitg. **40:** 155–156. 1925.—Freesias are sown in April or May in hotbeds. Seed are covered lightly with soil and then watered. After 3–4 weeks they germinate and the young plants are transplanted, preferably in "15" pots, 14 to 16 plants to the pot. They flower, the next year, from January until April.—*J. C. Th. Uphof.*

8824. Dürr, W. **Rugosa-Unterlangen für Treibrosen brauchbar. [Rugosa stocks of use in forcing.]** Möllers Deutsch. Gärtnerzeitg. **40:** 82–83. 1925.—Boskoop, Holland, is the principal place where roses are budded upon *Rosa rugosa* for forcing. On this stock rose varieties are stronger and the flowers are larger than when budded upon *R. canina.* Cases are known of living plants which were successfully grafted upon *R. rugosa* about 17 years ago. Further experience will prove whether this stock is preferable to others.—*J. C. Th. Uphof.*

8825. Farley, A. J. **Report of the Department of Pomology.** New Jersey Agric. Exp. Sta. Ann. Rept. **44:** 107–117. *1 pl.* 1923 [1924].—In a study of the growth rate of the apple fruit it was found that the rate was highest during the period between 2 and 3 weeks after petal fall and lowest during the 3 weeks just preceding maturity. There appears to be no correlation between rate of fruit growth and total weekly rainfall or between total precipitation or sum of heat units and size of the fruit.—In spraying investigations of tree fruits, it was found that while hydrated lime-copper dust caused considerable injury to the fruit and foliage, it gave better control of Brooks' fruit spot (*Phoma pomi*) than self-boiled lime sulphur, atomic sulphur or dry-mix lime-sulphur. Sulco V. B. caused serious injury to the fruit and foliage of the apple, while Keresol caused none. The addition of lime to concentrated lime sulphur did not prevent burning. The addition of one and one-half pounds of calcium caseinate to 200 gallons of concentrated lime-sulphur (1–50) did not increase the fungicidal or insecticidal value of the latter. A 3-10-50 Bordeaux mixture caused considerable russeting of the fruit and some burning of the foliage. The foliage on apple trees sprayed with Bordeaux mixture was a slightly deeper green than the foliage on trees sprayed with concentrated lime-sulphur.—*Wm. H. Martin.*

8826. Figueroa, C. A. **Los gandules en Puerto Rico. [The gandul in Porto Rico.]** Rev. Agric. Puerto Rico **11:** 45–52. *4 fig.* 1923.—The gandul or pigeon-pea (*Cajanus indicus*) has been cultivated in Porto Rico to a greater or less extent for many years and its use is now increasing. It is of value as a cover crop, as a stock food and for human consumption. Cultural directions are given.—*John A. Stevenson.*

8827. Firor, George H. **Cabbage culture.** Georgia State Coll. Agric. Circ. 94. *1-8.* 1924.—This paper discusses cultural methods for the cabbage in Georgia. The varieties Early Jersey Wakefield and Charleston Wakefield are recommended for commercial crops, and the Early Winningstadt, Brunswick, Succession, Flat Dutch and Early Summer for home use. Control of the common insects and diseases is discussed and a spray calendar appended.—*T. H. McHatton.*

8828. Friebel, Erich. **Drei neue immergrüne winterharte Gehölze. [Three new evergreen, hardy, woody plants.]** Möllers Deutsch. Gärtnerzeitg. **40:** 52. *2 fig.* 1925.—*Lonicera pileata* and *L. nitida* are new to horticulture and are recommended for low hedges. *Prunus Laurocerassus Fiesseriana* is derived from *P. laurocerasus Schipkaensis;* it is hardy and develops a pyramidal growth. The originator of the latter novelty is Fiesser, in Schweitzingen, Baden.—*J. C. Th. Uphof.*

8829. Galván, Modesto Martínez. **Apuntes sobre el cultivo del cafe. La Poda. [Notes on coffee culture. Pruning.]** Rev. Agric. Puerto Rico 11^4: 13–18. 1923.—Methods of pruning coffee trees are discussed, including both old and new plantings.—*John A. Stevenson.*

8830. Griebel, C. **Die Unterscheidung der einheimischen und amerikanischen Moosbeere in Zubereitungen. [Means of distinguishing between European and American cranberries in preserves.]** Zeitschr. Untersuch. Nahrungs- u. Genussmittel 48: 228–232. *Fig. 1–2.* 1924.—The American cranberry (*Vaccinium macrocarpon* Ait.) has recently appeared in European preparations labeled "Preisselbeeren" (mountain cranberry, specific name not given). The fruit more closely resembles that of the European cranberry (*V. Oxycoccos* L.). The two may best be distinguished in preserves by the seed characters. The seed-coat of *V. macrocarpon* is proportionately thicker and the kernel proportionately smaller than in *V. Oxycoccos.* The seed are figured in cross-section.—*E. E. Stanford.*

8831. Griffith, J. P. **Cultivando una neuva frambuesa in Puerto Rico. [Producing a new raspberry in Porto Rico.]** Rev. Agric. Puerto Rico 12: 190–191. 1924.—A number of raspberry species and varieties, including *Rubus probus* and *R. ellipticus*, have been introduced and grown experimentally by the Insular Experiment Station in the hope of obtaining a type superior to *R. rosaefolius* which, though it grows well on the Island, gives fruit of poor quality. *R. rosaefolius*, although not indigenous, grows wild in many parts of Porto Rico.—*John A. Stevenson.*

8832. Griffith, J. P. **El desarrollo de uvas adaptables a Puerto Rico. [The development of grapes adapted to Porto Rico.]** Rev. Agric. Puerto Rico 12: 401–404. 1924.—Preliminary experiments have been initiated looking to the development of grape varieties suited to Porto Rican conditions. A native species (*Vitis caribaea*) is being used in this work.—*John A. Stevenson.*

8833. Griffith, J. P. **Un estudio de variedades de aguacate para Puerto Rico. [A study of avocado varieties for Porto Rico.]** Rev. Agric. Puerto Rico 14: 213–218. 1925.—Most of the avocado varieties developed in Florida and California and by the U. S. A. Dept. of Agric. have been imported by the Insular Exp. Sta. in Porto Rico and their behavior under Porto Rican Conditions has been studied in order that the varieties best suited to commercial culture may be obtained. Native types also are being studied. Notes on the behavior of the varieties Spinks, Fuerte, Sharpless and others in Porto Rico, Florida and California, are given. —*John A. Stevenson.*

8834. Griffiths, David. **Production of grape hyacinth bulbs.** U. S. Dept. Agric. Dept. Bull. 1327. *1–15. Pl. 1–2, fig. 1–2.* 1925.—The bulletin deals with the group of plants indicated in the title from the standpoint of the producer of the stocks in this country and is based on cultural experiences at Bellingham, Washington, and in the vicinity of the District of Columbia. Cultural and handling directions are featured.—*Author.*

8835. Griffiths, David. **The Madonna lily.** U. S. Dept. Agric. Dept. Bull. 1331. *1–17. Pl. 1–2.* 1925.—The bulletin was designed to remedy a general lack of information among growers concerning methods of reproduction in this popular and well known ornamental. Methods of reproduction, therefore, are featured. Methods of increasing stocks by seed, by scales, by natural division of the bulb, and by layering and heeling in of the stems are fully described. General directions are given for culture and commercial handling of the bulbs. —*Author.*

8836. Griffiths, David. **The production of Narcissus bulbs.** U. S. Dept. Agric. Dept. Bull. 1270. *1–31. Pl. 1–9, fig. 1–2.* 1924.—This is a companion to Bulletin 1082 of the same series and author. It is intended primarily to give instruction to the many growers who are beginning the production of these stocks for the American market. It deals in the main with methods of culture, commercial handling, curing, and similar instruction needed by the grower rather than the buyer of the bulbs.—*Author.*

8837. Griffiths, David. **The production of tulip bulbs.** U. S. Dept. Agric. Dept. Bull. 1082. *1–48. Pl. 1–20.* 1922.—This bulletin is written expressly for the grower who produces bulb stocks in this country and it is based mostly on experience gained in the production of tulip bulbs at the government station at Bellingham, Washington, over a period of years. It treats of growing, handling in storage and transit, soils, varieties, yields, and the diffculties which the grower is likely to encounter.—*Author.*

8838. Grossner, H. **Torenien.** [**Torenias.**] Möllers Deutsch. Gärtnerzeitg. **40**: 72–73. *2 fig.* 1925.—On account of the long flowering period, Torenias are among the best pot plants. They are propagated from seed and from cuttings. Seed are sown in the middle of January in light soil. After 2–4 weeks the small seedlings are transplanted; they require much light and a fair amount of moisture. When well developed they are set in 8 cm. pots and later in 12 cm. pots. Recommendations include *Torenia Fournieri*, *T. Fournieri compacta grandiflora*, *T. Bailloni*, *T. speciosa* and *T. speciosa Die Braut* with white flowers.—*J. C. Th. Uphof.*

8839. Haage and Schmidt. **Lobelia erinus compacta atrocoerulea.** Möllers Deutsch. Gärtnerzeitg. **40**: 57. *1 col. fig.* 1925.—This is a 1925 novelty. Its flowers are larger than the Kaiser Wilhelm, and are deep gentian blue without eyespot. The originators are Haage & Schmidt, Erfurt.—*J. C. Th. Uphof.*

8840. Haase, C. **Neue Treibgurke "Haases Ideal."** [**The new forcing cucumber, "Haases Ideal."**] Möllers Deutsch. Gärtnerzeitg. **40**: 103. 1925.—Haase's Ideal is a prolific and resistant cucumber for forcing in cold frames. Fruit are a uniform dark green, 30–40 cm. long. It can be grown in the field. The originator is C. Haase, at Reichenau in Saxony.—*J. C. Th. Uphof.*

8841. Hartwell, B. L. **Rotations and successions as they affect the business vegetable grower.** Market Growers Jour. **34**^{7}: 300. 1924.—This paper presents a brief discussion of the results of experiments on the effects of crops on those which follow, conducted by the Rhode Island Exp. Sta.—*H. C. Thompson.*

8842. Hawkins, Paul D. **Root stocks for grapes in Florida.** Florida Fruits and Flowers **2**^{6}: 129–130. 1925.—After discussing the selection of grape root stocks with reference to the primary considerations, namely adaptability and congeniality, the author discusses the results of his tests of a number of stocks which he has tried in central Florida. Following this he tabulates for 18 of the root stocks which have proved best, their behavior in regard to such fundamental points as adaptability, congeniality, resistance, habit of growth, earliness, quantity and quality of fruit, and ease of reproduction and grafting.—*Arthur S. Rhoads.*

8843. Heppner, J. **June budding.** Amer. Fruit Grower **45**^{6}: 3, 13, 20. *Illus.* 1925.—This is a general discussion of the budding of deciduous fruit trees during the early summer with special reference to advantages and disadvantages, requisites, propagation of trees for June budding and care of the growing seedlings, method of budding, and care of the trees after budding.—*Arthur S. Rhoads.*

8844. Hetschold. **Veredlung hochstammiger Chaenomeles (Cydonia) japonica.** [**Chaenomeles (Cydonia) japonica on high stems.**] Möllers Deutsch. Gärtnerzeitg. **40**: 85. 1925.—The writer recommends ornamental Cydonias to be grown on stems instead of as shrubs. Stems of *C. japonica* and *C. camelliaeflora* 2 m. high are very beautiful when in flower. Grafting *C. japonica versicolor* on *Crataegus* is mentioned.—*J. C. Th. Uphof.*

8845. Heydt, Adam. **Mehr Amaryllis-Kultur.** [**More Amaryllis growing.**] Möllers Deutsch. Gärtnerzeitg. **40**: 179–181. 1925.—For forcing, strong bulbs 17–20 cm. or more in circumference are required. The bulbs are at first kept dry and warm. When they are through the resting period and have developed a bud of 4–5 cm. in length they are placed in pots. Until flowering time they are held in a temperature of 12–15°C. Treatment of the bulbs after flowering until the next forcing is described.—*J. C. Th. Uphof.*

8846. Hollis, S. D. **How much is certified seed worth?** Market Growers Jour. **34**^{2}: 49. 1924.—This is a report of a farmer using certified potato seed in comparison with other seed.—*H. C. Thompson.*

8847. Hutson, Ray. **The relation of bees to fruit growing.** New Jersey Agric. Exp. Sta. Ann. Rept. **44**: 313–320. 1923. [1924].—Ten to twelve colonies of honey bees were placed in a pear orchard and observations made on the number of bees flying on various dates. Counts made on trees at selected points north, south, east and west, and 25 to 100 yards from the central group of hives showed that the numbers decreased as the distance from the hives increased. Two trees of Kieffer topworked to Leconte were caged, with and without a hive of bees, respectively; on the tree caged with the bees 4.08% of the blossoms set fruit, as compared with 0.10% for the cage without the bees.—Similar studies were conducted with apples. Two trees of the Jonathan and Wealthy varieties were enclosed in a single wire screen cage and a hive of bees was placed therein during the blooming period. Another cage with trees of the same variety had no bees. On the Wealthy, 17% of the blossoms set fruit with bees and 4.07% without bees. With the Jonathan, 8.2% set fruit with and 0.8% without the bees.—*Wm. H. Martin.*

8848. Hutton, S. W. **Cultivating blueberries for profit.** Market Growers Jour. 34^7: 292. 1924.—This is a discussion of methods used in growing blueberries in New Jersey.—*H. C. Thompson.*

8849. Johnston, S. **Winter pruning the black raspberry.** Michigan Agric. Exp. Sta. Spec. Bull. 143. *1–22. Fig. 1–5.* 1925.—Practically all buds on the main canes and laterals of the black raspberry (*Rubus occidentalis*) were found to be potential fruit buds. Fruit production of individual canes was found to be closely correlated with their size. Heavy pruning of these plants effects a thinning of the fruit but is attended by such material increases in size of berries that total yield is reduced little, if any. This heavy pruning should consist mainly in a heading back of main canes and laterals, rather than in thinning out, if the size of berry is to be increased. Heavy heading back resulted in a much larger amount of foliage on each fruiting lateral and it is suggested that this may have been responsible for the accompanying larger size of the berries.—*V. R. Gardner.*

8850. Kilgus, G. **Topf-Vorkultur der Buschbohnen unten Glas. [Growing dwarf beans at first in pots under glass.]** Möllers Deutsch. Gärtnerzeitg. 40: 102–103. 1925.—The writer recommends sowing beans in pots in frames; they can be planted out in the field during the middle of May after danger of frost has gone. Through this method earlier crops will be obtained, often by the beginning of June.—*J. C. Th. Uphof.*

8851. Kluyver, A. J. **Klappervezel- en Klappergarennijverheid. [Coconut fibers and coconut fiber textiles.]** Kolon. Inst. Amsterdam. Mededeel. 20. (Afdeel. Handelsmus. 5.) *xiii + 305 p. 100 pl. 2 maps.* 1923.—A complete report is given on the production of coir, copra and other coconut products based on a thorough study of this industry in Ceylon and the Malabar coast, with reference to the further development of the industry in the Netherlands Indies.—*L. H. Dewey.*

8852. Kordes, W. **Die Schönsten einfachen und halbgefüllten Rosen. [The finest single and half-double roses.]** Möllers Deutsch. Gärtnerzeitg. **40**: 6–9. 34, 78–79. 1925.—A number of single and semi-double roses are described as of use for various ornamental purposes in different parts of Germany.—*J. C. Th. Uphof.*

8853. Krug, O., und G. Fiesselmann. **Die 1924-er Weinernte in der Pfalz. [Vintage of 1924 in the Palatinate.]** Zeitschr. Untersuch. Nahrungs- u. Genussmittel 49: 111–114. 1925.—This paper deals with weather conditions and the chemical characters of the crop.—*E. E. Stanford.*

8854. Limbacher, Karl. **Grünveredlung der Obstbäume. [Green-grafting of fruit trees.]** Möllers Deutsch. Gärtnerzeitg. 40: 185–186. *1 fig.* 1925.—The writer grafts when the scion and stock are entirely green and succulent, about the middle of May. As soon as the shoots of the scion and stock have a length of 8 to 10 cm., the shoot of the stock is pinched off just under a leaf; the stem is now split with a knife through the middle to the next node; in this wound the scion is inserted, after it has been cut off wedge-shaped. The graft is tied and union is accomplished in about 10 to 14 days. The wounds heal better than when grafted in the dormant season.—*J. C. Th. Uphof.*

8855. Lobjoit, W. G. **Notes on horticultural research and development.** Welsh Jour. Agric. 1: 153–156. 1925.—These notes, supplied by the Controller of Horticulture, Ministry of Agriculture and Fisheries, contain details of the method by which assistance is rendered by the Government to the horticultural industry in England and Wales. The numbers of Advisory Officers, County Horticultural Superintendents and Instructors, Farm Institutes and Demonstration Farms are given, together with a list of Research Stations in England dealing with horticultural problems. The writer points out that the system is designed not only to place the latest scientific and practical information gathered from all over the world at the service of the practical cultivator, but also to provide means by which all manner of problems of horticultural interest may be entrusted to experts competent in the various lines of research. The writer states that there are still areas in England and Wales capable of horticultural development waiting for cultivators to apply the necessary capital and labor, and expresses surprise that there should be so little horticultural development in Wales, in parts of which the soil and climate are suitable for the production of early potatoes and other vegetables supplies of which are at present transported from long distances.—*Author.*

8856. Lord, Elizabeth C. **Roses in Florida.** Florida Fruits and Flowers 2^6: 136–137, 158. *Illus.* 1925.—This is a general discussion of rose culture in Florida, rootstocks, insects and diseases, and varieties best suited to Florida conditions.—*Arthur S. Rhoads.*

8857. Lord, E. L. **Discussions on Florida horticulture. The citrus rootstock problem.** Florida Fruits and Flowers 2^6: 132–133; 3^1: 8–9. 1925.—The citrus rootstock problem is discussed in detail for Florida concerning the trifoliate orange (*C. trifoliata*), grape-fruit (*C. grandis*), mandarin (*C. nobilis*), lime (*C. aurantifolia*), and various hybrid stocks. A bibliography is appended. (See also Bot. Absts. 14, Entry 7852.)—*Arthur S. Rhoads.*

8858. Lyon, A. V. **Problems of the viticultural industry.** Inst. Sci. and Indust. Australia Bull. 28. *1–84. 17 fig.* 1925.—The subject is treated under the general heads of vineyard establishment, pruning and training, irrigation, drainage, manurial problems, fruit drying, routine work, fungous diseases, and insect pests. The Baumé test as a measure of ripeness is recommended despite the numerous difficulties involved. Cincturing Zante currants and Sultana grapes usually results in an increased yield, but, at least with the latter fruit, ripening is delayed and the quality is less desirable. Cincturing Sultanas is a questionable economic procedure. The diseases, black spot (*Manginia ampelina*), downy mildew (*Plasmopara viticola*), and Oidium (*Uncinula spiralis*) are popularly described and control measures discussed in some detail.—*L. R. Waldron.*

8859. McCubbin, W. A. **Factors in the success of domestic quarantines.** Jour. Econ. Entomol. 16: 253–262. 1923.—Four features of domestic quarantines are discussed: (1) The legal aspect involves consideration of an adequate basic law, a well organized and capable staff, and an emergency fund to meet sudden cases. (2) The quarantine should be given close attention by the scientist from the standpoint of the administration. (3) In quarantine methods, emphasis is placed on the need of extensive and intensive surveys at the outset, and for emergency research to provide a basis for a permanent policy. Stress is laid also on the need of well planned methods and adequate machinery and the importance of fairness and strictness in enforcement. The official in charge of enforcement should be a man of high ability. (4) The public judges quarantines on the fairness and reasonableness of the enforcement rather than on the severity of the restrictions. Quarantine measures are more easily enforced in populations with a high average intelligence and a well developed sense of public duty. After 1 successful quarantine experience in a district a 2 nd is accepted with less reluctance.—*Author's abstract.*

8860. McHatton, T. H. **Bush lima beans.** Georgia State Coll. Agric. Circ. 95. *1–4.* 1923.—This paper presents an elementary discussion of lima bean culture under Georgia conditions.—*T. H. McHatton.*

8861. McHatton, T. H., E. Ragsdale, and J. W. Firor. **Vegetable gardening.** Georgia State Coll. Agric. Bull. 257. *1–40. 8 fig.* 1922.—A general handbook for vegetable gardening in Georgia.—*T. H. McHatton.*

8862. Macoun, W. T. **New varieties of apples originated at the Central Experimental Farm.** Agric. Gaz. Canada 9^2: 96–99. 1922.

8863. Marx, Th., und A. Zimmermann. **Über das Klebrigwerden des Kautschuks. [Stickiness of caoutchouc.]** Tropenpflanzer 25: 35–41, 83–87. 1922.—Manihot caoutchouc was coagulated in different media. Subjected to sun exposures dry caoutchouc became sticky in some cases after 1–2 days. Probably this is due to 2 kinds of oxidations, under the influence of one of which the caoutchouc becomes semi-fluid and under the other it remains more solid. It becomes quickly liquid when coagulation takes place in a mixture of KCl and Mwenger sap (a *Cissus* species). Freshly coagulated caoutchouc may be exposed to sunlight without becoming sticky. Heat works like sunlight, especially when coagulation takes place in the mixture mentioned above. Moist and dry caoutchouc do not become liquid when properly treated mechanically, with not too much heat. Iron and copper compounds also cause stickiness. The brownish, wax-like excretions which occur on caoutchouc not watered during drying, have no connection with stickiness.—*J. C. Th. Uphof.*

8864. Matzka, Fr. **Buschbohnen in Topfen als Nebenkulturen. [Dwarf-beans in pots as a secondary crop.]** Möllers Deutsch. Gärtnerzeitg. 40: 31, 54–55, 1925.—Growing dwarf beans in pots under cover out of season is very profitable. When sown in August they are harvested at the end of October; sown at the beginning of November, they are harvested in the middle of January; sown at the beginning of January they are harvested the middle of March.—*J. C. Th. Uphof.*

8865. MÜLLER, ALFRED. **Nochmals: Rosa-Rugosa Stamme. [Rosa rugosa stock.]** Möllers Deutsch. Gärtnerzeitg. **40:** 52–53. 1925.—*Rosa rugosa* is planted in the same way as *R. canina.* The land must be well manured and the soil around the plants well packed. Unlike *R. candida,* this species is not suited to pure sandy soil. Budding takes place in the same way as with *R. canina.* The bending down of the stems of *R. rugosa* is the most difficult proposition, as many plants are lost through careless handling.—*J. C. Th. Uphof.*

8866. MÜLLER, REINHARD. **Eine Chrysanthemum-Auslese. [A Chrysanthemum selection.]** Möllers Deutsch. Gärtnerzeitg. **40:** 58-60. 1925.—Growing varieties of *Chrysanthemum indicum* for bouquets is an important industry. A number of varieties are described belonging to various groups important in Germany.—*J. C. Th. Uphof.*

8867. NAMBIYAR, K. G. **Method of tapping coconut trees in the West Coast.** Year Book Madras Agric. Dept. **1923:** 9–21. 1924.—Production of jaggery or crude sugar from the juice obtained by tapping the coconut palm is an ancient industry on the West Coast of South India. The method of preparation of the spadices and the appliances used are described.—*P. S. Jivanna Rao.*

8868. NASON, ROGER S. **The berry outlook in Florida.** Florida Grower **31**^{26}: 9. 1925.—Some advantages and disadvantages of the Florida Marvel blackberry are presented; many plants fail to produce fruit. Blackberry growing in Florida is in its infancy. The writer recommends hybridization of tropical Rubus species with northern improved varieties.—*J. C. Th. Uphof.*

8869. NORTON, J. B. **The story of Mary Washington asparagus.** Market Growers Jour. **34**^{6}: 299, 232. 1924.—The author presents a brief history of his development of this variety (or strain) of rust resistant asparagus.—*H. C. Thompson.*

8870. PANGRETOS, A. **The packing of oranges.** Cyprus Agric. Jour. **20:** 57, 59. *1 fig.* 1925.—The average number of oranges produced in Cyprus is estimated at 35,000,000. These are of excellent quality and if properly packed should successfully compete with foreign oranges in any market. The total exportation in 1923 was about 10,000,000 fruit, most of which were sent to Salonica. At present most of these oranges are poorly graded and packed. The fruit should be gathered after the dew has evaporated. Six standard sizes of fruit are said to be in demand in the English markets: Nos. 133, 144, 152, 160, 182, and 240. Three sizes of boxes are used as follows: 70 × 35 × 28 cm.; 68 × 34 × 30 cm., 68 × 34 × 27 or 28 cm. These boxes are divided into 2 compartments. The number of oranges per box in most favor in England is 144. The main orange markets in England are Liverpool, Manchester, London, Hull and Glasgow. Instruction is offered in the packing of oranges by the Agricultural Department.—*W. Stuart.*

8871. POHLIG, MAX. **Altes und Neues über den Aussaat der Gladiolen Brutzwiebeln. [Sowing young Gladiolus bulbs.]** Möllers Deutsch. Gärtnerzeitg. **40:** 66–68. *1 fig.* 1925.—Young bulbs withstand considerable cold; older bulbs are more susceptible. The author (in Dresden-Tolkewitz) at first sowed broadcast on beds at the end of April and harvested in October. In later years he left the bulbs in the beds during the winter covered with turf mulch and a layer of leaves; even after severe winters the plants came up well in the spring.—*J. C. Th. Uphof.*

8872. POHLIG, MAX. **Blühende Pfingstrosen. [Flowering peonies.]** Möllers Deutsch. Gärtnerzeitg. **40:** 165. *2 fig.* 1925.—The writer recommends especially *Paeonia chinensis festiva maxima* and Mme. Forel. They require a heavy soil. August until mid September is the best time for transplanting and division; but this is done also in the spring.—*J. C. Th. Uphof.*

8873. PREUSS, PAUL. **Der Tropen-Kammer-Trockner "Guinea." [The "Guinea" tropical drying room.]** Tropenpflanzer **27:** 7–11. *2 fig.* 1924.—The artificially heated "Guinea" drying room described can be used for drying copra. It is suggested that the apparatus may also be used for cacao, coffee and other crops.—*J. C. Th. Uphof.*

8874. PREUSS, PAUL. **Über machinelle Einrichtungen in Kokospalmplantagen. [Mechanical equipment in coconut palm plantations.]** Tropenpflanzer **25:** 1–16. 1922.—The writer mentions the use of various machines and tools in the coconut plantations in relation to location, size of the plantation, climatic conditions, soil management, treatment of the harvest, manufacturing of copra, of oil, drying, and the use of the coconut shells.—*J. C. Th. Uphof.*

8875. Preuss, Paul. **Über "Reife" und Trocknung des Kakaos. ["Ripening" and drying of cacao.]** Tropenpflanzer 27: 11–20. 1924.—Unripe pods of the yellow fruited varieties can be distinguished by a green color; the red fruited ones are somewhat difficult to distinguish, although when ripe they become lighter, frequently yellowish red. Commercial cacao is derived from ripe fruits. Harvesting of the Forastero, Amelonado and Calabacillo cacao on a Cameroons plantation, is described. Ripe fruits are cut off with knives or scissors and then shelled. They are placed in fermentation bins where they are covered and the contents mixed at the proper time. In the morning (after 44–45 hours) the contents are taken out, sometimes washed, and dried in the sun. An acid scent is acquired. Unwashed beans are more difficult to dry. At evening the beans are put in heaps and still contain some moisture. The next day they are dried in the sun. Washed beans have a brown color, becoming brownish red the 3rd day. At this time the beans are still somewhat moist in the center, the taste is bitter. Other fermentation bins, with seed of the same degree of ripeness are handled after 68 hours, and 4–6 days fermentation. In the latter instance the beans have swollen considerably; the bitter taste is here mild. The fermentation period of the Criollo (48 hours) is shorter than of the Foastero. Criollo beans have a pleasant flavor. Arriba has better flavor than any other, but apparently does not ferment regularly. A good strain of the Forastero from Samoa and New Guinea is mentioned; its beans are as plump as those of the Criollo but the trees have the characteristics of the Forastero as to resistance to disease and strong growth. It is not easy to distinguish sun-dried beans from those artificially dried, especially when fermentaton has been good; in case the latter has been incomplete, differences are more pronounced. Sun-drying is cheaper for the small plantation owner; artificial drying is recommended for larger plantations, especially when harvest and a rainy period come at the same time. Artificial drying is also described.—*J. C. Th. Uphof.*

8876. Preuss, Paul. **Zur Biologie der Kokospalme. [The biology of the coconut palm.]** Tropenpflanzer 27: 128–132. 1924.—Various views are presented as to the distribution of the coconut seed through the agency of sea water. According to some, the coconut palm was originally suited to a dry environment on the plateau region of South America. The writer presents several indications that the seed are not adaptable to a dry climate.—*J. C. Th. Uphof.*

8877. Reasoner, E. N. **Suggestions on planting tropical subjects in Florida.** Florida Fruits and Flowers 2^6: 153. 1925.—Because of general ignorance of the principles of plant growth and requirements as to climate, evidenced by orders for tropical plants to be set out in all parts of the South, the author calls attention to the limitations of tropical plants with reference to climatic conditions. Tropical subjects for planting in Florida are divided roughly into 3 groups, namely, shrubs, trees and palms. A number of tropical shrubs are cited that may be grown well above central Florida with only a temporary setback by cold spells. Trees of the tropics are not recommended for planting much above extreme southern Florida unless in very protected areas south of large lakes or other bodies of water where frost is least felt; many of these trees will not even sprout after freezing. In palms the danger from frost is said to be more serious than in the other 2 groups, as they have but 1 terminal bud and if this is at all frosted the plant will die outright. It is said that very few palms should be planted outside of the protected coast country of Florida from Fort Pierce on the East Coast around to St. Petersburg on the West Coast and that it is inadvisable to set them in the interior of the State at all.—*Arthur S. Rhoads.*

8878. Riechers, Hermann. **Neuheit Primula obconica grandiflora Stern von Jenfeld.** Möllers Deutsch. Gärtnerzeitg. 40: 168. *2 fig.* 1925.—*Primula obconica grandiflora* Stern von Jenfeld originated from a cross of Hamburger rosa × Ronsdorfer grandiflora, which was in turn crossed with the Berliner race. The flowers are large and dark; they bloom from October until March. The originator is Hermann Riechers, in Jenfeld, near Hamburg.—*J. C. Th. Uphof.*

8879. Rolfs, P. H. **Horticulture in Brazil.** Florida Grower 31^{17}: 9. 1925.—Probably no other country has such a large number of unknown and untested species of native fruit as the interior of Brazil. The cashew grows into large trees producing fruit as large as a medium sized apple in the low lands near the sea. In the high mountains and on the plateau they grow as small shrubs not more than 18–20 inches high and bearing fruit about the size of plums. The kernels of the cashew nuts are very delicious, are exported to some extent, and may always be purchased in Rio de Janeiro. The jaboticaba develops berries of pleasing and distinctive flavor on the trunk and larger limbs. The pera do campo is a fruit that is very rarely found on the markets of the larger cities. Its odor is most appetizing and the best varieties have a delicious flavor. The climate of Brazil, excepting a small portion of the south, is favorable to citrus growing; about 90% of the trees are seedlings. The Washington Navel, Selecta, Pera and Natal varieties are grown.—*J. C. Th. Uphof.*

8880. Rosa, J. T., Jr. **Plant protectors for early vegetables.** Market Growers Jour. **34**^{4}: 136, 137. 1924.

8881. Ruschmann, Wilhelm. **Tomatenbau auf Tenerife und Gran Canaria. [Tomato growing on Teneriffe and on Grand Canary.]** Tropenpflanzer **27**: 137–141. 1924.—On the Canary Islands, tomatoes are grown from sea level to an elevation of 350 m.; in higher parts they are not successful. Plants are grown on light as well as on heavy soils. Very little is done in the selection of seedlings. Round fruits of medium size are preferred. Two hundred fifty to 325 gm. of seed are used per ha. Tomatoes can be grown throughout the entire year. Seedbeds are made at the end of July. When plants are 4–5 weeks old, they are set in the field in rows 90–95 cm. apart, with plants at 60–65 cm. in the row. Of each plant 2–3 stems are retained. Foliage is thinned from the base for proper light. Fertilizers, diseases and pests are described. From 4 to 4½ months after sowing the fruit is harvested. Production varies from 15,000 to 22,000 kg. per ha. When fruit become colored near the calyx, although the rest is still green, they are picked; reaching the market after 4 days, they are red; they may keep 20–30 days from the date of picking. It is claimed that tomatoes grown under the trade-winds have poorer keeping quality than others.—*J. C. Th. Uphof.*

8882. Sante, E. **Tomaten zweitriebig. [Two-stemmed tomatoes.]** Möllers Deutsch. Gärtnerzeitg. **40**: 182–184. *3 fig.* 1925.—The writer planted tomatoes at greater distance in the field than usual (0.8 × 1.5 m.). Through this method he obtained more fruit. The remaining soil can be planted with other vegetables. The plants were grown with 2 stems and under proper treatment, gave an excellent harvest. Pruning and manuring are described.—*J. C. Th. Uphof.*

8883. Schelle, E. **Mitteilungen über Koniferen. [Contributions about conifers.]** Mitteil. Deutsch. Dendrol. Ges. **29**: 37–52. 1920.—Many conifers are described. The rare *Cunninghamia sinensis* R. Br. when propagated from cuttings usually produces bushy plants. A seedling 5-m. high is mentioned. This species is not resistant to cold. *Fokienia Hodginsii* Hendry and H. H. Thom. seems to be hardy in East Friesland and on the Island of Mainau. Young trees of *Picea Koyamai* Shiras resemble *Picea excelsa,* of which it may be an alpine form. *Pinus Merkusii* Jungh. & deVries, from the mountains of Sumatra and Borneo, is a greenhouse plant. The hybrid, *Torreya nucifera* × *T. grandis*, originated in Germany.—*J. C. Th. Uphof.*

8884. Schermerhorn, L. G. **Report of the Department of Vegetable Gardening.** New Jersey Agric. Exp. Sta. Ann. Rept. **44**: 93–105. *2 pl., 4 fig.* 1923 [1924].—With tomatoes, highest yields were obtained on plots receiving 800 pounds of acid phosphate, 200 pounds of potassium chloride and 100 pounds of nitrate of soda. In a 2nd test, conducted over a period of 3 years, the highest yield, in 1922, resulted from the application of 1000 pounds of a 6–4–6 fertilizer.—A tabulation of the yields (1922) of sweet potatoes on plots receiving various combinations of nitrogen, phosphoric acid and potash showed that a 6–2–8 mixture gave the highest yield. The 7 highest yielding plots in 1921 had an average fertilizer formula of 3.1–6.8–6 and in 1922 3.7–4.0–8.2. In a 2nd test different fertilizer mixtures were used at the rate of 1000 pounds per acre. The Yellow Jersey, Big Stem Jersey and Red Jersey varieties yielded in the order named. In a 3rd test a study was made of nitrogen sources and amount of potash. In the nitrogen source studies, highest yields resulted from the use of tankage, sulphate of ammonia and fish in the order named. The yield of the potash plots varied from 132.2 bushels following an application of 2–8–0 to 266 bushels where a 3–8–8 was applied.—With asparagus, highest yields were obtained from plots receiving 10 tons of manure, 500 pounds of a 4–8–4 fertilizer in the spring, 1000 pounds of the same fertilizer after cutting and a non-leguminous cover crop.—With cantaloupes the 1st pickings from plants grown in veneer bands were made on Aug. 3 and the last on Aug. 17, when the 1st picking was made from field-planted seed. Highest yields were obtained from plots on which a rye cover crop was plowed under and where 150 pounds of muriate of potash and 45 pounds of acid phosphate per acre were broadcasted, 250 pounds of tankage distributed under the rows and a side dressing of a mixture of 100 pounds of nitrate of soda and 100 pounds of dry ground fish applied when the runners were about 12 to 15 inches long.—*Wm. H. Martin.*

8885. Schneck, H. W. **Settling the Honey Dew.** Market Growers Jour. 34^{14}: 25. 1924. —This is a discussion of the origin of the Honey Dew melon. The consensus of opinion of the authorities who have given this subject careful study is that the Honey Dew is not a hybrid as claimed by some, but that it is identical with the White Antibes Winter, a variety listed by Vilmorin-Andrieux & Co., Paris, France.—*H. C. Thompson.*

8886. Schwarzer, Gustav, and H. Walter. **Die Vermehrung der Paeonia arborea.** [Propagating Paeonia arborea.] Möllers Deutsch. Gärtnerzeitg. 40: 166. 1925.—*Paeonia arborea* is propagated by triangular grafting on roots of *P. chinensis*, in August and September. Scions contain 2 to 3 buds. Stocks are placed in deep pots and kept in a cold green house or cold frame. In the spring the scions start growing and plants are set in the field the following summer.—*J. C. Th. Uphof.*

8887. Scoggins, C. Verne. **Preparing California cherries for shipment.** Amer. Fruit Grower 45^7: 4, 8. *Illus.* 1925.—This is a general descriptive account of the preparation of California cherries for the market.—*Arthur S. Rhoads.*

8888. Sessoms, Wm. A. **The Satsuma, aristocrat of the oranges.** Florida Grower 31^{21}: 6. *2 fig.* 1925.—The best location for the Satsuma orange is fairly level land on the south slope of a long hill. The best soil is a sandy type, containing at least a small percentage of clay or having a clay subsoil within 3 feet of the surface. The best time for planting is January. *Citrus trifoliata* is the best stock. Cultivation starts with fertilizing about the last of February or beginning of March. The general rule is to fertilize twice a year, about the beginning of March and again in June.—*J. C. Th. Uphof.*

8889. Sievers, A. F., and Frank Rabak. **Utilization of almonds for various food products.** U. S. Dept. Agric. Dept. Bull. 1305. *1–21. Fig. 1–9.* 1924.—Formulas are given and methods of preparation described for several food products which can be prepared from almonds, thus providing an outlet for those varieties which are not suitable for sale as unshelled nuts. Besides salted almonds and almond paste, which are now on the market, the following new products are suggested: Almond butter, a preparation similar to peanut butter; almond confection, for use in cakes and wafers; and almond powder, a convenient product for baking macaroons. Some cost estimates of the raw materials, containers and manufacturing equipment required are given and a factory layout for the manufacture of the products is described. —*A. F. Sievers.*

8890. Simmons, Chas. **Smyrna fig culture in Western Australia.** Jour. Dept. Agric. Western Australia 2nd Ser. 1: 468–471. *1 fig.* 1924.—The method of fertilization with pollen from the Capri or wild fig, by the agency of a small wasp, is described. The process of preparing the ripe figs for packing is outlined.—*P. J. Olson.*

8891. Starring, C. C. **Premature seeding of celery.** Market Growers Jour. 34^8: 330. 1924.—Experiments conducted by the Montana Exp. Sta. show that, of the several factors tested, only one, namely, subjecting young plants to cool temperatures, contributed to the production of seed stalks. The other factors considered were: Early planting of seed, growing plants in poor and in rich soils, checking growth by permitting the soil to become dry, trimming plants severely and banking the plants in the field 3 or 4 weeks before the ordinary time. Plants from early sown seed produced more seed stalks than later seedings when they were subjected to low temperature. When warm temperature was maintained there was no difference between early and late sowing. The difference in data of sowing was only 1 month. —*H. C. Thompson.*

8892. Stoutamire, Ralph. **$60,000 plus in 15 years from pecans.** Florida Grower 31^{16}: 6–7. *2 fig.* 1925.—The Mahan pecan which originated in Kosciusko, Mississippi is a large fruited, very thin-shelled variety and is claimed to be sufficiently free from diseases.—*J. C. Th. Uphof.*

8893. Stover, W. J. **Grapes on high land.** Florida Fruits and Flowers 2^{6}: 152, 160. 1925.—The author describes the cultural methods and practices that have been followed in the establishment of an experimental vineyard on high sandy land near Leesburg, in central Florida.—*Arthur S. Rhoads.*

8894. Stuckey, H. P. **Watermelons.** Georgia Agric. Exp. Sta. Bull. 143. *1–21. 3 pl.* 1924.—This is a general discussion of watermelon culture, taking up soils, fertilization, planting, cultivation, thinning, pruning and harvesting. The discussion includes varieties and the important watermelon diseases with their control.—*T. H. McHatton.*

8895. Swingle, U. G. **Successful greenhouse tomato crop.** Market Growers Jour. 34^{7}: 291. 1924.

8896. Tapley, W. T. **The relation of blossom habit and early planting to the yield of squash.** Market Growers Jour. 34^{6}: 246–247, 252. 1924.

8897. Tompson, H. F. **The dandelion.** Market Growers Jour. 34^{5}: 205. 1924.—This is a description of methods of growing the dandelion in Massachusetts.—*H. C. Thompson.*

8898. Topf, R. **Erfurter Levkojenzucht.** [**Growing Matthiola annua in Erfurt.**] Möllers Deutsch. Gärtnerzeitg. **40**: 75–76. 1925.—For seed production seed are sown in February in half-warm beds. Formerly, 7 plants but now 12 plants are put in a pot. Further details of pot growing are presented.—*J. C. Th. Uphof.*

8899. Topf, R. **Zur Rentabilität der Levkojen-Samenzucht.** [**Profitableness of growing seed of Matthiola annua.**] Möllers Deutsch. Gärtnerzeitg. **40**: 64–65. 1925.—Much depends on whether the stocks are grown in pots or outside in the field. Cases are given where growing *Matthiola annua* for seed has been profitable when the plants were grown outside. Often it is necessary to grow them in pots under cover on account of lack of space. Such plants need extra care and are therefore more expensive. It is a question whether seed-growing of stocks is profitable at present; less are grown than formerly.—*J. C. Th. Uphof.*

8900. Uphof, J. C. Th. **Anbau und Verkauf von Citrusobst in den Vereinigten Staaten.** [**Growing and selling of citrus fruits in the U. S. A.**] Tropenpflanzer **25**: 72–83, 110–112. 1922. —A general review is given of citrus propagation, planting of groves, picking and shipping and of the activities of the California Fruit Exchange. Extensive literature citations are appended.—*Author.*

8901. Uphof, J. C. Th. **Clausena Lansium, eine für West Indien geeignete chinesische Frucht.** [**Clausena Lansium a suitable fruit for the West Indies.**] Tropenpflanzer **27**: 96–97. 1924.—The Wampi or *Clausena Lansium* from China is productive and grows well on the Exp. Sta. grounds near Havana, Cuba. Some were grafted on grape fruit.—*Author.*

8902. Uphof, J. C. Th. **Der Avocado in Süd Florida.** [**Avocado in Southern Florida.**] Tropenpflanzer **26**: 118–123. 1923.—Avocados are becoming more and more popular. Chemical analyses of some varieties and seedlings are given. The varieties are propagated by budding on seedling stocks in April or May. Trees are planted in January and March. Velvet beans and cow peas are used as cover crop and green manure plants. Worthless seedling trees are topworked. Picking and shipping are described. Different varieties of the Mexican, Guatemalan and West Indian groups are mentioned.—*Author.*

8903. Uphof, J. C. Th. **Der Loquat in den Vereinigten Staaten.** [**The loquat in the U. S. A.**] Tropenpflanzer **25**: 41–43. 1922.—In California the loquat is sometimes grown at intervals of 12 feet in rows 24 feet apart. Good varieties are Early Red, Thales, Champagne Victor and Advance. They are propagated by grafting but usually from budding on loquat seedlings or quince cuttings; the latter are made in December and budded the following August or September.—*Author.*

8904. Uphof, J. C. Th. **Gemüsebau in den Tropen und Subtropen der Neuen Welt.** [**Vegetable growing in the tropics and subtropics of the new world.**] Tropenpflanzer **28**: 1–11. 1925.—A description is given of growing of the principal vegetables in Florida and Cuba. —*Author.*

8905. Waldron, C. B. **Trees, shrubs and plants for North Dakota farmsteads.** North Dakota Agric. Exp. Sta. Ext. Div. Circ. 67. *1–28. 7 fig.* 1925.—A popular discussion is given of the hardy trees, shrubs and vines suitable for North Dakota. Trees suitable for windbreaks, timber, and for ornamental purposes, both evergreen and deciduous are enumerated. —*L. R. Waldron.*

8906. Weigelt, Carl. **Die deutsche Cyclamenkultur und Cyclamenzuchtung. [Cyclamen growing and breeding in Germany.]** Möllers Deutsch. Gärtnerzeitg. 40: 132–135. 1925.—Cyclamen raising started about 1870, when the old *Cyclamen persicum* only was grown; no improved races were known with the exception of some colored varieties. Richard Müller in Striesen-Dresden started, about 1873, by breeding large-flowering *C. persicum splendens* (*C. robustum* × *C. persicum*). The first varieties were white with red eye spots; soon other colors came having the scent of *C. persicum.* In 1874 and 1875 Miro obtained large flowering plants which were sold at high prices in Dresden. Later, from Williams in England came the *giganteum* and, from Graff, the *Universum*, mostly white. In the exposition at Mülheim in 1883 the dark blood-red Ruhm von Worm was introduced by Karl Riedel, his Crimhilde also gained attention. In 1889 appeared *C. splendens* Katchen Stoldt with snow white flowers and the still cultivated Rosa von Marienthal from Carl Stoldt; Ruhm von Wandsbek also is one of his plants. In 1905, O. Froebel in Zürich offered the first salmon-colored varieties. From Alwin Richter in Striesen-Dresden came in 1895 the fringed giganteum. The Papilio originated with Draps-Dom in Laeken, Belgium. Herman Danker produced for the firm, J. C. Schmidt, in Erfurt, the Rococo race which originated from Giganteum × Papilio. The Victoria with fringed margins and those with double flowers are of secondary importance. The latter do not breed true from seed.—*J. C. Th. Uphof.*

8907. Welsch, J. **Die Goiaba. [The Guava.]** Tropenpflanzer 25: 232–233. 1922.—The guava (*Psidium guayava*) is one of the most common fruit of the subtropical zone of Brazil. It is found wild or has escaped from cultivation. Seedlings bear the first year. The fruit is recommended to those having lung troubles. It produces an excellent jelly. Related plants are araca (*Psidium araca*) and guaviroba (*Campomanesia virescens*) the fruit of which also can be used for jelly. When the araca is grafted upon guava, the fruit of the former are larger. The guava produces smaller but better flavored fruit when grafted upon the araca. This condition as to grafting exists also between guava and guaviroba.—*J. C. Th. Uphof.*

8908. Wester, P. J. **El cultivo de la roselle y su utilidad práctica. [The use and culture of roselle.]** Rev. Agric. Puerto Rico 11^{6}: 57–62. *2 fig.* 1923.—The roselle (*Hibiscus Sabdariffa*) is an annual malvaceous plant cultivated throughout the tropics for its bright red fleshy calyces. Cultural directions are given.—*John A. Stevenson.*

8909. Wilson, E. H. **America's greatest garden; the Arnold Arboretum.** *ix + 123 p. 50 pl.* Stratford Co.: Boston, 1925.—In the 1st chapter of this book the author gives an account of the history and the general features of the Arnold Arboretum, which was founded in 1872 and has been controlled since that time by C. S. Sargent, whose portrait forms the frontispiece of the book. The remaining 18 chapters deal with the outstanding features of the Arboretum during the 4 seasons, and the most important and ornamental trees and shrubs of the collection, such as cherries, crabapples, lilacs, azaleas, rhododendrons, hawthorns, oaks and hickories, conifers, and climbing plants. There is also a chapter on trees and shrubs that furnish food for birds and one on the shrub garden. In the last chapter, the work which the Arboretum has accomplished and is doing, is briefly summed up. The 50 plates are reproductions of well selected and excellent photographs, chiefly of groups and single plants of some of the most ornamental trees and shrubs of the collection.—*Alfred Rehder.*

8910. Wohlfarth, Otto. **Der Einfluss der natürliche Verhältnisse auf den Kakaobau. [Influence of natural conditions on cacao growing.]** Tropenpflanzer 27: 145–157. 1924.—A general description is given of cacao raising; views of various investigators are presented. The cacao prefers the climate found in the evergreen tropical forest, with little change of temperature and ample rainfall. The savanna forest is unfavorable. Nearness to the sea, as in Trinidad, San Thome and Samao, is often of advantage. The writer discusses distance of plants in the plantation, pruning, protection from sun and wind, pests, diseases, soils and production.—*J. C. Th. Uphof.*

8911. Wood, Milo N. **Almond varieties in the United States.** U. S. Dept. Agric. Dept. Bull. 1282. *1–141. Pl. 1–26, fig. 1–16.* 1924.—The presence in California of a large number of almond varieties inferior for the market and unsatisfactory to the grower, and the confusion existing in the nomenclature, led to an extensive botanical study of the varieties and a careful investigation of the value of each from economic and cultural standpoints. Detailed technical descriptions of all the varieties grown in the U. S. A. are presented with a key based on the characteristics of the nuts. The merits and defects of each variety are given with suggestions as to the choice of varieties. Early attempts at almond production in the U. S. A., the origin of each variety, and the present distribution are discussed. Foreign varieties little known in the U. S. A. are briefly considered. The information is supplemented by accurate drawings and photographs.—*Author.*

8912. Woodroof, J. G. **The Pineapple pear.** Georgia Agric. Exp. Sta. Bull. 142. *1–23. 8 pl.* 1923.—It is probable that the Pineapple pear is a hybrid between some of the members of the European and oriental groups of pears. This pear has been known for ¾ of a century in the U. S. A. It is a poor dessert fruit but excellent for canning; it was named Pineapple on account of its aroma. This pear is propagated mostly by cuttings. Cultural methods are discussed. The latter part of the paper deals with the resistance of this pear to blight (*Bacillus amylovoruis* (Burr.) De Toni), and with experiments which demonstrated its resistance. The inoculated shoots died, but the disease did not spread to other twigs or down the tree. This variety is considered of special value for breeding purposes.—*T. H. McHatton.*

8913. Work, Paul. **Varieties of celery.** Market Growers Jour. 34^{10}: 411. 1924.—A recommended list of standard varieties includes 3 strains of Golden Self Blanching, Easy Blanching and Giant Pascal. A secondary list mentioned includes White Plume, Emperor, Shumaker, Boston Market, French Success, Winter King and Winter Queen.—*H. C. Thompson.*

8914. Wright, R. C. **Coloring Satsuma oranges in Alabama.** U. S. Dept. Agric. Dept. Bull. 1159. *1–22. Fig. 1–3.* 1923.—Satsuma oranges in Alabama ordinarily become entirely edible and meet the requirements of the U. S. A. Dept. of Agric. Food Decision 182 some weeks before they assume a full orange color on the tree. Coloring is forced by the action of the exhaust from a gasoline engine or by the product of incomplete combustion from a kerosene stove. This action destroys the green chlorophyll which masks the desirable yellow color and enables the growers to market their fruit 4–6 weeks sooner than if it were left to color on the tree. Fruit carrying up to 40% natural yellow ordinarily requires 4 days to develop a full color in the coloring room.—*Author.*

8915. Wright, R. C., and George F. Taylor. **The freezing temperatures of some fruits, vegetables and cut flowers.** U. S. Dept. Agric. Dept. Bull. 1133. *1–7.* 1923.—Freezing or freezing injury does not always occur when fruit or vegetable products are exposed to temperatures at or below their actual freezing points. Under certain conditions many of these products can be undercooled, and again warmed without freezing and without apparent injury. Various products under certain conditions may be actually frozen and then thawed out without apparent injury, while, on the other hand, some products are injured if stored at temperatures well above their actual freezing points. Evidence seems to show that different individuals of the same variety and strain when grown under different conditions will have somewhat different freezing points, and that there are also some variations in the freezing points of products of the same variety and from the same lot. Average freezing points are given for several varieties of fruits and vegetables.—*R. C. Wright.*

8916. Young, Robert A. **Cultivation of the true yams in the Gulf region.** U. S. Dept. Agric. Dept. Bull. 1167. *1–14. Pl. 1–10.* 1923.—The paper is devoted mainly to a consideration of certain varieties of the greater, or 10-months yam, *Dioscorea alata* L., found to be suited to cultivation in the far southern U. S. A., together with directions for their culture and use. Five other edible species of some importance in the tropics are figured and briefly described: *D. cayenensis* Lam., the yellow Guinea yam; *D. esculanta* (Lour) Burkill, the lesser yam; *D. latifolia* Benth., the acom; *D. rotundata* Poir., the white Guinea yam; and *D. trifida* L. f., the yampi. The nomenclature followed is that used by I. H. Burkill, of the Singapore Botanic Gardens. The purpose of the paper is to make available to prospective growers the results of field experiments showing that some of the true yams may be grown in the Gulf region of the U. S. A. and that when properly grown and handled they constitute an acceptable food, similar in character to the ordinary potato. Attention is directed to the entire distinctness of the true yams from the sweet potato, some varieties of which are popularly called yams in certain localities. References to literature are given.—*Author.*

8917. Young, Robert A. **Taros and yautias; promising new food plants for the south.** U. S. Dept. Agric. Dept. Bull. 1247. *1–22. Pl. 1–11. fig. 1–16.* 1924.—This is a discussion, economic and botanical, of certain species and varieties of the aroid genera, *Colocasia* (taros) and *Xanthosoma* (yautias), producing edible corms and cormels, found suited to cultivation in the southern U. S. A. The species *C. esculenta* (L). Schott is revived and includes nearly all the economic erect-growing taros, such as the dasheens (*C. antiquorum* Schott, var. *globulifera* Engler and Krause, in Das Pflanzenreich, Heft 71, IV, 23E, p. 68, 1920); the small-tubered taros (of the dasheen type) of Japan and China; all the important Hawaiian taros; and a valuable purple-fibered southern Chinese taro for which the varietal name Penang (=Pin nang, etc.) is adopted. To *C. antiquorum* Schott are referred the red-skinned taros of spreading habit, such as the colocasia, or culcas, of Egypt; the common elephant-ear plant ("Caladium esculentum"); the "blue" tanyah (red skinned) of the South Atlantic States; the Igname Vermelho of Madeira; and the Hong-hwa (Mandarin name) of China. The Igname Branca of Madeira and the "yellow" tanyah (white skinned) are considered identical and of a different species, possibly undescribed. These conclusions are the results of studies of the growing plants supplemented by laboratory studies of the varieties that flower. Discussion of the yautias is mainly economic, and the name *X. caracu* Koch and Bouche (Das Pflanzenreich, Heft 71, IV, 23E, p. 52, 1920) is accepted uncritically for the important variety Rolliza (hort.) of the West Indies. *X. brasiliense* (Desf.) Engl. is also accepted for the belembe, or Indian Kale, of Porto Rico and the Isthmus of Panama; the leaves only of this species are used. There is brief discussion of certain economic varieties of undetermined species of Xanthosoma and of the edible qualities of all the taros and yautias mentioned in the paper. References to literature are included.—*Author.*

MORPHOLOGY, ANATOMY AND HISTOLOGY OF VASCULAR PLANTS

E. W. Sinnott, *Editor*

(See also in this issue Entries 8434, 8507, 8552, 8574, 8642, 8693, 8739, 9074, 9164, 9517, 9529, 9612, 9665)

8918. Bambacioni, Valeria. **Sopra alcune anomalie delle radici di Vicia Faba L. [Anomalies of the roots of Vicia Faba L.]** Annali di Botanica 16: 244–252. *Pl. 4–6.* 1924.—Cases of schizorhizy in lateral roots of *Ricinus communis*, *Lupinus* sp. and *Cucurbita Pepo* are reported and a similar case in *Vicia Faba* is described in great detail, showing the development of the vascular bundles. It is attributed to parasitic attacks.—*P. D. Caldis.*

8919. Barkley, Grace. **Secondary stelar structures of Yucca.** Bot. Gaz. 78: 433–439. *Fig. 1–9.* 1924.—The structure and development of secondary vascular tissues in *Yucca* is described. Such growth is similar to that of other monocotyledons which have secondary growth. The cambium is of pericyclic origin, and the secondary bundles developed by this meristem originate from 1 or 2 initials. These bundles are usually collateral, though sometimes amphivasal. Similar secondary growth occurs about wounds. The course of the leaf traces is described.—*A. J. Eames.*

8920. Champion, H. G. **Contributions towards a knowledge of twisted fibre in trees.** Indian Forest Rec. 11^2: 11–80. *13 pl.* 1925.—Observations on *Pinus longifolia* indicate that the unidirectional spiral movement of protoplasm in an elongated growing cell may give a spiral structure to the cell wall, resulting in a tendency to inclination emphasized by sliding growth. If not corrected by the growing cells, the degree of twist may increase indefinitely. While the trees are young, the twist is to the left, but later it may change to the right. As seedlings possess the characteristic, injury alone is not responsible, though irritation due to injury may increase the twist. Twist appears also to be associated with local accumulations of food materials. Little thought has been given to its inheritance. Examination of 6,000 seedlings of known origin and of various ages indicates that straight-grained trees give fewer seedlings of twisted grain than spiraled trees.—Forest management, by seed selection and by proper thinnings, should bring about the elimination of trees with twisted grain.—*E. N. Munns.*

8921. Davis, Robert L. **Flax stem anatomy in relation to retting.** U. S. Dept. Agric. Bull. 1185. *1–26. Fig. 1–23.* 1923.—Retting proceeds from the cambium layer outwards. The loose core test, in common use, to determine the completion of retting is hence ineffective, as the early retting of the cambium layer releases the cortex from the central wooden core several days before the fibers are separated from the rest of the cortex. The order in which the tissues are retted depends upon the solubility and thickness of the pectin layer in the cell wall and the proximity to the central wooden core. The phloem parenchyma and the parenchyma between the fiber bundles lie near the cambium and have relatively small amounts of pectin; they are disintegrated next. The outer parenchyma which unites the fiber bundles and the epidermis has very thick layers of pectin and is the last principal tissue to be retted. The water-proof union of the fiber bundles, wood branches, and cuticle formed by the leaf scars makes retting more difficult at the nodes than at the internodes. The following changes do not indicate that retting is complete as they occur some time in advance of the end point: Increased brittleness of the wooden core, maximum sliminess of stems, a change in exterior color of stem from yellow brown to very light cream yellow, and sinking of the straw. The changes in the flax stem most closely associated with completion of retting are disintegration of the leaf scars, mechanical separation of the cuticle and separation of the fiber bundles from the rest of the cortex. Various mechanical methods for testing wet flax stems for completion of retting are described. Based on the final changes in retting, the leaf scar and epidermis tests were devised. The former is made by pulling the girth of the cortex away from the wooden core, at right angles to the stem, and starting near the root end. Retting is said to be complete when there is no resistance to separation at the nodes. The leaf scar test is held more dependable than the loose core test, and its dependability may be increased by supplementing it with the epidermis test in which the loosened cortex is moved to and fro in clear water in order to observe whether the cuticle is thoroughly loosened and the fibers are sufficiently divided.—*Author.*

8922. HARLAN, HARRY V., AND MERRITT N. POPE. **Some cases of apparent single fertilization in barley.** Amer. Jour. Bot. 12: 50–53. *1 pl.* 1925.—In barley, occasional kernels were found which lacked an embryo but possessed a normal endosperm, and others which lacked endosperm but possessed an embryo. This is probably due to the absence of the normal double fertilization, either the egg or the endosperm nucleus failing to be fertilized.—*E. W. Sinnott.*

8923. HOLROYD, ROLAND. **Morphology and physiology of the axis in Cucurbitaceae.** Bot. Gaz. 78: 1–45. *Pl. 1–3, fig. 1–5.* 1924.—A discussion in detail of certain histological aspects of the structure of seedling and mature plants of *Luffa, Cucumis, Curcurbita, Momordica,* and other genera.—*A. J. Eames.*

8924. KINDO, M. **Ueber die in der Landwirtschaft Japans gebrauchten Samen. [The seed used in Japanese agriculture.]** Ber. Ohara Inst. Landw. Forsch. 2: 397–428. *Fig. 39–48.* 1924.—This is a descriptive study of seed and seedlings of the following plants: *Cannabis sativa, Morus* sp., *Perilla nankinensis, Perilla ocimoides,* and *Sesamum indicum.*—*H. S. Reed.*

8925. LAURENT, J. **Contribution à l'étude du Pinus monophylla. [Contribution to the study of Pinus monophylla.]** Rev. Gén. Bot. 37: 5–22. 1925.—The observations of the author conclude that *Pinus monophylla* is normally a species with a single leaf, but which has in some cases an increased number of needles. This variation in the number of needles is not, however, restricted to *Pinus monophylla,* but has been observed, more or less rarely, in all the species of the genus. *Pinus halepensis,* for example, which generally possesses 2 leaves, may (following wounding) present 3 and very rarely 1. There is, in the case of *Pinus monophylla,* neither abortion nor conjunction of leaves. In no section was the author able to find at the side of the single leaf the least trace of a rudimentary one, or the union of more organs. The simple leaf is formed entirely by itself, and apparently normally, on the short branch which carries it. Allowing for its isolation, it occurs as a prolongation of the branch, being pushed back at the side of the terminal meristem as is shown in the anatomical investigations. Twin leaves develop as in pines with 2 needles, from either side of the short branch, leaving the terminal meristem of the branch between them. Contrary, therefore, to the idea of Bertrand, the needle of *Pinus monophylla* is not the continuation nor the end of the branch of which the structure is progressively modified into that of a leaf, but is a true leaf. It is, therefore, more exact to maintain this species in the place to which it is assigned in the classification of DeCandolle. It fits well in the section Pinaster, in which it is convenient to establish (beside the group Pinea, reserved for pines with 2 needles) a group, Monophylla. *Pinus monophylla* is the only representative of this new group which is characterized by single leaves on short branches. It is only occasionally that the branches have 2 or 3 leaves.—*J. C. Gilman.*

8926. Leach, W. **An anatomical and physiological study of the petiole in certain species of Populus.** New Phytol. 23: 225–239. *Pl. 3, 3 fig.* 1924.—The amount of bending and torsion the petiole of *Populus* is liable to undergo is related to its structure. The arrangement of the different tissues affords effective protection to the more delicate ones.—Under wilting conditions the leaves of *Populus* fall into the profile position by bending and torsion of the petiole, but not more readily than those of some other trees. There is a greater percentage loss of water from the petiole in *Populus* and other leaves than from the lamina. This increases the flexibility of the petiole.—*I. F. Lewis.*

8927. Lenoir, M. **Note de technique histologique. [Note on histological technique.]** Rev. Gén. Bot. 37: 187–189. 1925.—Simultaneous double coloration with Congo red and solid green to be used with material preserved in alcohol, is described.—*J. C. Gilman.*

8928. Lisk, Henrietta. **Cellular structure of tendrils.** Bot. Gaz. 78: 85–102. *Fig. 1–5.* 1924.—A description of the cellular structure of the tendrils of *Cyclanthera explodens.* The paper is largely given to a review of the literature of tendril structure.—*A. J. Eames.*

8929. Myers, Lynette. **Tyloses in Menispermum.** Bot. Gaz. 78: 453–457. *Pl. 11–12.* 1924.—The abundant tyloses of the vessles, which are said to develop in midwinter, contain as they grow, abundant cytoplasm and nuclei. Nuclear division was observed, and "intertylosing" occurs where pits are developed between continguous tyloses.—*A. J. Eames.*

8930. Poli, Aser. **Fusti volubili: "destrorso" e "sinistrorso" (Dextrorsum vel sinistrorsum volubilis). [Clockwise and counter-clockwise twiners.]** Annali di Botanica **16:** 297–307. *Pl. 8.* 1924.—The author reviews the definitions given to the term "dextrorsum vel sinistrorsum volubilis" by Linnaeus, A. deCandolle, A. P. deCandolle, Targioni-Tozzetti, Darwin, Ducharte, VanTieghem, Sachs, Detmer, Strasburger, Bonnier, and Massart, as well as by authors in mechanics, zoology and mathematics. He finds that Linnaeus is not clear on the subject, and the other botanists differ in their definitions on account of the difference in the way of looking at the spiral. Some imagine themselves inside and some outside of the spiral. The author proposes that the spiral should be viewed with the observer always on the outside and that *Phaseolus* and *Convolvulus* should be defined as dextral, *Humulus* and *Lonicera* as sinistral.—*P. D. Caldis.*

8931. Priestley, J. H., and Frances M. Radcliffe. **A study of the endodermis in the Filicineae.** New Phytol. 23: 161–193. *Fig. 1–12.* 1924.—In the Filicineae each vascular strand is enclosed within an endodermis which at first shows the Casparian strip alone, but later usually develops a suberin lamella. The fatty acid of the Casparian strip is deposited in the substance of the wall. The suberin lamella consists of fatty substance, but is not acid in reaction, and is not deposited on a basal, cellulose-like substance as in the Angiosperms. It shows 3 stages of development. The distribution of the endodermis is traced in species of *Pieris, Pteridium, Dryopteris, Nephrodium* and *Dicksonia.* The primary endodermis allows the passage of water and inorganic solutes, but probably impedes the outward passage of solutes. The secondary endodermis when fully developed practically prevents all exchange. Materials experimented with were lead nitrate, dyes, and sugar. The tertiary endodermis of Angiosperms is lacking. The problem of the origin of the 2 types of endodermis is discussed without final conclusions. The relation of the endodermis is discussed from the standpoint of normal apical development, adventitious buds, phellogen, lateral roots, the development and functioning of the frond, the production of a dry "vagin"-impregnated cortex, and the slight production of a cuticle.—*I. F. Lewis.*

8932. Reed, Edward L. **Anatomy, embryology and ecology of Arachis hypogea.** Bot. Gaz. 78: 289–310. *Pl. 5–6, fig. 1–11.* 1924.—A summary of the salient botanical facts concerning the peanut together with some researches on ovule development. The embryo sac is typical but the antipodals soon disappear. A massive proembryo is formed.—*B. W. Wells.*

8933. Sahni, Birbal. **On the structure and affinities of Acmopyle Pancheri, Pilger.** Phil. Trans. Roy. Soc. London B. **210:** 253–310. *Pl. 9–11, 39 fig.* 1920.—A description is given of the anatomy of *Acmopyle Pancheri* based chiefly on material from its native habitat, New Caledonia. It is thought that the genus also occurs in Fiji. *Acmopyle* does not differ from *Podocarpus* in vegetative anatomy of root, stem and leaf; drupaceous character of the seed; megaspore membrane; female prothallus and young embryo; structure of male cone; microsporophyll; pollen-grain or, probably, male gametophyte. As is generally the case in *Podocarpus*, the seed is borne on a thick, fleshy receptacle composed of the swollen axis and bracts. The surface of the receptacle is tuberculate, and is raised into more or less prominent humps in the axils of the sterile bracts. The vascular supply to these axillary humps is in the form of paired strands inversely oriented with respect to the subtending bract-traces; the humps are therefore concluded to be vestigial axillary shoots, the entire receptacle being regarded as a reduced branch system. The vascular supply to the ovuliferous organ in the axil of the fertile bract does not differ, except in its much greater degree of development, from that to the humps in the axils of the sterile bracts; the ovuliferous organ is hence regarded as a brachy-blast, and homologised with the ovuliferous scale of other conifers. *Acmopyle* differs from *Podocarpus* in (1) the nearly erect posture of the adult seed; (2) the complete fusion of the epimatium to the integument, even in the region of the micropyle, in the formation of which the epimatium takes part; (3) the much greater development of the vascular system of the seed, which forms a nearly continuous cup-like tracheal investment covering the basal ⅔ of the stone. Taking into consideration the entire structure of *Acmopyle*, the genus is concluded to be the most highly specialized of the Podocarpineae. There appears to be no support for the view that the family is a reduction series with *Podocarpus* as one of its most primitive genera. The systematic position of the Taxineae is discussed and the phylum Taxales is proposed, for *Taxus*, *Torreya* and *Cephalotaxus*, as equivalent in rank and related to the Ginkgoales and Coniferales.—*W. R. G. Atkins.*

8934. SOUVILLE, G. **Observations sur le dimorphisme sexuel du Mercurialis annua L. [Observations on the sexual dimorphism of Mercurialis annua L.]** Rev. Gén. Bot. 37: 49–62. 1925.—There exists in the annual *Mercurialis* an evident morphological, and probably also a physiological, dimorphism. From the morphological point of view the female individuals are easily distinguished from the males by a more branched form, and a more bushy, compact appearance due to the insertion of the branches of the first order at right angles and to the more feeble growth of the internodes at the summit. They seem also to have shorter leaves than the male. The male plants, on the other hand, have a slender appearance resulting from the insertion of the primary branches at an acute angle and the very great elongation of the internodes at the summit; their leaves are longer and a little larger, and the petioles are much longer.—From the physiological point of view, the female plants have a larger proportion of dry matter and a greater osmotic pressure, and their leaves are greener. The females have greater longevity than the males; they grow more slowly for a longer time and differentiate their tissues less rapidly.—The author points out that the secondary sexual characters are relatively important for wind pollination. Thus the male flowers are more numerous than the female, and are disposed on the long axis of the branches. Their anthers are carried on long flexuous filaments and their sepals stand in a vertical plane, all characters that favor wind pollination. The female plant is better disposed to receive the pollen because of its squat habit and its straight branches, carrying flowers exposing their stigmas in a horizontal plane.—*J. C. Gilman.*

8935. TROLL, WILHELM. **Die Fruchtstielanschwellung von Oxalis acetosella L. Eine frucht- und samenbiologische Studie. [The swelling of the peduncle of Oxalis acetosella L. A study of the biology of the fruit and seed.]** Flora 117: 344–378. *6 fig.* 1924.—In *Oxalis acetosella*, about 3 days before the seed is ripe, there is a rapid enlargement of the peduncle. It occurs usually in 2 zones in chasmogamous and in 1 zone in cleistogamous flowers. The cells do not increase in number but the water content increases about 100%, half of the water coming from the capsule and seed and half coming up through the stalk. The water movement is osmotic and is related to the conversion of the large starch reserve in the cortex into sugar. The movement of water back into the peduncle is followed by a shifting of water in the 3 layers of the seed coat. These processes are related to the dehiscence of the seed pod and the discharge of the seed.—*A. G. Stokey.*

8936. TUFTS, WARREN P., AND E. B. MORROW. **Fruit-bud differentiation in deciduous fruits.** Hilgardia 1: 1–14. *Pl. 1–11.* 1925.—This paper gives the results of a study of the date of fruit-bud differentiation in almond, apple, apricot, cherry, peach, pear and plum. It was considered that a definite broadening and thickening of the floral axis is the 1st evidence of differentiation of the floral parts, and examinations of material were made at short intervals from May to December. Under California conditions little variation occurs in the date of differentiation within any 1 species. There is a brief survey of the literature, and a table summarizing the results of work done by other investigators, not only on the fruits noted above, but also on the blackberry, cranberry, currant, filbert, gooseberry, grape, raspberry and strawberry.—*Margaret Buvens.*

8937. Turner, James J. **Origin and development of vascular system of Lycopodium lucidulum.** Bot. Gaz. 78: 215–225. *Fig. 1–7.* 1924.—The histology and ontogeny of the stem and leaf of *Lycopodium lucidulum* is described in considerable detail. A superficial group of apical cells gives rise to the dermatogen and periblem, and a deeper group to the plerome. The ontogeny of the vascular tissue is very slow, 3 seasons being necessary to complete the development at a given level. The leaf primordium consists at first of a single cell; later, the surrounding tissue is involved. As usual in such cases, the development of the leaf trace and leaf bundle proceeds basipetally and acropetally from the base of the leaf primordium. The stele is an exarch, radial protostele. The foliar bundle is mesarch and consists wholly of spiral protoxylem; in this bundle phloem is said to be absent.—*A. J. Eames.*

8938. Wightman, E. P. **Modification of the Spence-Herzberg method for microscopic examination of paper pulp fibers.** Paper 31: 14. 1923.—A sample of the paper, or pulp, to be examined is well pulped in the usual way. The fibers are teased apart and allowed to dry on the slide. After the slides of the whole series to be tested are completed, as well as those of the standard pulps containing known quantities by weight of the various kinds of fibers, the fibers on each slide are moistened with a drop of water, and the excess of water is removed. Three or four drops of the Herzberg zinc chloride-iodine stain are then added, and after about a minute a cover glass is placed on top, and the excess of stain squeezed out. The percentages of the various kinds of fibers can be estimated visually by comparing each sample with the standards, under 2 similar microscopes fitted with a Zeiss comparison eye-piece. By drying the fibers on the slide it is possible to use the standard samples more than once. In a day or 2 the fibers nearly lose their color, but it was found possible to remove the cover glass without disturbing the fibers and to wash, dry, again moisten, and re-stain the standard samples. The time of doing this was found to be shorter than that necessary to prepare new samples, and the process can be repeated several times. The wood fibers should have a lavender or moderately light blue color, and should never be allowed to become dark purple, because when this happens the rag fibers, which are transparent wine color when the wood fibers are lavender, become very dark and approach the purple color of wood fibers, and hence do not show sufficient contrast. By preparing a whole series of samples first and then staining and examining them all in succession, the standards have to be made up less often and more reliable results can be obtained.—*Author.*

8939. Williams, May M. **Anatomy of Cheilanthes tenuifolia.** Bot. Gaz. 78: 378–396. *Pl. 8–10.* 1924.—The anatomy of this xerophytic Australian fern is described in detail. The fern is a simple, dictyostelic form in a genus in which other species are solenostelic or transitional between solenostelic and dictyostelic. The leaf trace is single, and with the simple bundle of the petiole forms a type usually associated with solenosteles. Protoxylem is lacking in the rhizome. The plant is of typical xerophytic structure throughout.—*A. J. Eames.*

8940. Wilson, Carl L. **Medullary bundle in relation to primary vascular system in Chenopodiaceae and Amaranthaceae.** Bot. Gaz. 78: 175–199. *Fig. 1–19.* 1924.—An anatomical study of the primary vascular system of a number of species of Chenopodiaceae and Amaranthaceae. A probable method of evolution of the medullary bundle arrangement of *Amaranthus*, and perhaps of other dicotyledons, is derived from this study, and is presented in a series showing increasing complexity. The steps are possibly as follows: (1) The cauline bundles on either side of an entering leaf trace pass into the pith for a short distance (probably because of the influence of the node), and return quickly to their normal position just under the extrafascicular cambium; (2) this condition becomes exaggerated, the cauline bundles become medullary throughout their course in the stem; (3) the bundles of the trace behave in a similar manner. In the earlier stages of such development, these bundles are members of the peripheral ring of bundles; later their course in the stem becomes more and more extended until they are finally completely medullary. It is suggested that medullary bundles in various dicotyledonous families have probably had independent origin in those families or in groups of closely related families. Further evidence of the close relationship of the Chenopodiaceae and Amaranthaceae is presented.—*A. J. Eames.*

8941. Woodcock, E. F. **Observations on the morphology of the seed of Phytolacca.** Papers Michigan Acad. Sci. 4: 413–418. *Pl. 20–21.* 1925.—The study of the development of the seed shows that endosperm is formed normally, but at no time reveals the presence in it of starch or aleurone. On the other hand starch appears early in the tissues of the nucellus. In the mature seed the endosperm has disappeared or is represented by a thin layer of crushed cells except around the side and top of the hypocotyl. Here it remains several cells in thickness but contains no visible stored food, nor does it show any indication of functioning as a digestive region, as was suggested by Johnson. The storage region of the perisperm consists of cells packed with compound and simple grains of starch.—*Ernst A. Bessey.*

MORPHOLOGY AND TAXONOMY OF ALGAE

Wm. Randolph Taylor, *Editor**

(See also in this issue Entries 8392, 8400, 8402, 8436, 8444, 8451, 8452, 8454, 8455, 8458, 8461, 8467, 8476, 8480, 8481, 9073, 9079, 9081, 9354, 9513)

8942. Allorge, P. **Desmidiees du Lac de Grand-Lieu. [Desmids of Grand-Lieu Lake.]** Rev. Algologique 1: 462–470. *Pl. 9.* 1924 (1925).—A list of 91 desmids is given from beds of Characeae and *Myriophyllum*, from the shores and the areas of Cyperaceae. New to France are: *Triploceras simplex* n. sp., *Euastrum spinulosum* Delp., *Cosmarium binodulum* Lütkem. *C., binum* Nordst., *C. formulosum* var. *Nathorstii* (Boldt) W. & G. S. West, *C. obtusatum* Schmidle, *C. pachydermum* var. *aethiopicum* W. & G. S. West, *C. Portianum* var. *nephroideum* Wittr., *C. protractum* DeBary, *C. pseudo-exiguum* Racib., *C. pseudo-exiguum* var. *angustatum* W.&, G. S. West, *C. subprotumidum* var. *Gregorii* (Roy & Biss.) G. S. West, *C. subrectangulare* Gutw., *Xanthidium antilopaeum* var. *Hebridarum* W. & G. S. West, *Staurastrum gracile* var. *coronulatum* Boldt, *S. Aubertianum* var. *Archeri* (Gutw.) W. & G. S. West, *S. planum* (Wolle) W. & G. S. West, *Onychonema laeve* var. *micranthum* Nordst.—*Wm. Randolph Taylor.*

8943. Amossé, Aug. **Diatomées de la cote orientale d'Afrique. [Diatoms from the east coast of Africa.]** Bull. Mus. Hist. Nat. [Paris] 30: 247–254. *Fig. 1–6.* 1924.—The author lists 62 species of diatoms, collected mostly from Zanzibar. The genera dealt with chiefly are: *Nitzschia, Raphoneis, Dimerogramma, Plagiogramma, Biddulphia,* and *Triceratium. Plagiogramma Zanzibaricum* is described as a new species.—*John M. Fogg, Jr.*

8944. Benecke, Wilhelm. **Zur Frage nach den Bedingungen der Konjugation bei der Gattung Spirogyra. [Conditions for conjugation in the genus Spirogyra.]** Flora 118–119: 27–39. 1925.—As a result of his experiments with several species of *Spirogyra*, Benecke criticizes the rigidity of Ulehla's conclusion that the reaction of the medium is the factor which determines whether vegetative growth or zygote formation will take place. The pH for zygote formation cannot be sharply defined, as there is a range of H-ion concentration, usually small, within the limits of which either vegetative growth or conjugation may occur; other factors, for example, lighting or nutrition, determine which process will take place. In *S. majuscula*, an exceptionally plastic species, zygotes may form at pH 6.8–7.2, but under other conditions at pH 9.0. Benecke suggests that in work with algae, as in work with yeast, it is desirable to use definite criteria for growth, such as increase in dry weight, rate of cell division, etc.; and that in considering "optimum conditions for zygote formation" it is necessary to remember that the optimum conditions are not the same for all stages of the process.—*A. G. Stokey.*

8945. Børgesen, F. **Marine algae.** Dansk Bot. Arkiv 4^7: 14–35. *17 fig.* 1924.—Near and on Beata Island, St. Domingo, there were collected 64 species, including undetermined specimens of the genera *Cladophora* and *Polysiphonia*, and *Ceramium comptum* Børg. n. sp., and *Ceramium brevizonatum* var *caraibica* H. E. Petersen & Børg. n. var., with critical notes especially on *Neomeris annulata* Dickie, *Caulerpa racemosa* (Forsk.) Weber., *C. sertularioides* (Gmel.)

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* Due to temporary absence of the Editor, responsibility for the section this issue rests in part with the Associate Editor-in-Chief.

Howe, *Sargassum vulgare* C. Ag., *Acrochaetium Daviesii* (Dillw.) Thuret, *Galaxaura flagelliformis* Kjellm., *Ceramium transversale* Collins & Hervey, *Laurencia gemmifera* Harv., *Polysiphonia sphaerocarpa* Børg., and *Coelothrix irregularis* (Harv.) Børg.—The author takes exception to the theory of Sjöstedt that the bulk of the seaweed in the Sargasso Sea has originated from plants torn loose from the coasts of the West Indies and America and carried away by the currents, and gives data supporting his contention that "their contribution to the enormous masses of seaweeds in the Sargasso Sea is nil."—*Wm. Randolph Taylor.*

8946. Børgesen, F. **9. Marine algae from Easter Island.** (In: Skottsberg, Carl, (Editor). **The natural history of Juan Fernandez and Easter Island. Vol. 2. Botany.**) *P. 247–309. Fig. 1–50.* Almquist & Wiksells: Uppsala, 1924.—The author says that "the present incomplete list of species shows that this very isolated island possesses a both rich and varied marine flora of which a more thorough investigation is highly desirable. . . . . On the whole most of the species are small, the largest one found is *Sargassum* spec. Many species form low tufts and have a cartilaginous thallus. These different types of thallus are most certainly adjustments to the very strong surf that contunually beats the shores of this extremely exposed island."—The author discusses 9 species of the Chlorophyceae; 16 species of the Phaeophyceae, of which the following are described as new species—*Ectocarpus Chrosporae, Mesospora Van-Bosseae*, and *Sargassum* sp. to be determined by L. G. Sjöstedt in a separate paper; and 43 species of Rhodophyceae of which the following are described as new species:—*Erythrocladia vagans, E. Laurenciae, Acrochaetium discoideum, A. Ralfsiae, Galaxaura paschalis* (Sect. Brachycladia Sonder.), *Rhizophyllis pacifica, Ethelia pacifica, Melobesia paschalis, Amphiroa Yendoi, Callithamnium paschale, Ceramium Skottsbergii* H. E. Petersen, *Laurencia claviformis, Chondria* (Subgenus *Coelochondria*) *repens, Gymnogongrus aequicrassus*, and *Chrysymenia Skottsbergii.*—*Frederick V. Rand.*

8947. Brandt, R. P., and J. W. Turrentine. **Potash from kelp; early development and growth of the giant kelp, Macrocystis pyrifera.** U. S. Dept. Agric. Bull. 1191. *1–40. Fig. 1–16.* 1923.—The researches here described were undertaken as a part of the broader study of the economic utilization of the giant kelps of the Pacific as an industrial raw material for the manufacture of potash and other chemicals. This paper is one of a series dealing with this subject; emphasis accordingly has been placed on the practical use of the results obtained as applying to the best utilization and conservation of the areas of growing kelp. The subjects dealt with are, therefore: (1) The life history of this alga from the spores to the mature plant, including a discussion of propagation in aquaria, early stages, later stages, development of hold fast, regrowth, branching, types of development, life cycle of the individual frond and size attained; (2) growth with reference to environment, including a discussion of the influence of the substratum, depth, temperature, winds, wave action, storms, salinity, rainfall and light; (3) seasonal variation in conditions of kelp beds discussed from the point of view of crops obtainable; (4) destruction by natural agencies, including a description of the most common and destructive disease, "black rot;" and (5) methods and effects of harvesting and yields, describing the various methods of mowing, their comparison, periods of harvesting and yields. Various experimental data are tabulated and a list of the literature cited is given.—*J. W. Turrentine.*

8948. Cholnoky, B. **Adatok Budapest Bacillariea-inak olterjedése ismeretéhez. [The distribution of the Bacillarieae in the Budapest region.]** Bot. Közlemények 20: 66–79. *1 fig.* 1922.—The author gives an annotated list of the diatom flora of Budapest, including the following which are new for Hungary; *Asterionella gracillima* at Ráckev, *Nitzschia Kützingiana* at Ördögárok, and elsewhere. The ecology of the algae listed is discussed.—*I. Györffy (translated by Wm. R. Taylor).*

8949. Crow, W. B. **The reproductive differentiation of colonies in Chlamydomonadales.** New Phytol. **24**: 120–123. 1925.—Abnormal variants of *Pandorina, Eudorina*, and *Stephanosphaera* are cited as possibly belonging to genetic strains distinct from the normal type. There is a tendency to produce sterile cells in all 3 genera. These somatic cells may occur in a definite area (type β) or spread throughout the whole colony (type γ). *Eudorina* β is equivalent to *Pleodorina* Shaw; and *E.* γ to *Besseyosphaera* Shaw. The β and γ types of *Pandorina* are unnamed, as is the β type of *Stephanosphaera.* The *Eudorina* γ type described by West may be termed *Eudorina γ Westii* or *Besseyosphaera Westii* n. nom. (et. nud.).—*I. F. Lewis.*

8950. Czurda, Viktor. **Zur Kenntnis der Geschlechtsverhaltnisse bei Spirogyra. [Sexuality in Spirogyra.]** Ber. Deutsch. Bot. Ges. 42: 441–444. 1924.—Artificial cultures of the sexually differentiated *S. Weberi* Kütz. were made. The form used was the original scalariform-conjugating type described by Kützing. The laterally conjugating Rhynchonema species described by Cleve, Cook and others is responsible for the view that lateral conjugation is found in this species. To obtain filaments of known sex the free ends of pairs elsewhere in conjugation were isolated and cultivated on agar. In some of these supposedly monosexual cultures, in from 16 to 20 days after the inoculation, normal scalariform conjugation with ripe zygospores appeared after a period of good vegetative growth. Both male and female filaments were able to show this phenomenon. The recapitulation of this experiment was possible in one case only, due to the overwhelming growth of bacteria in others. This unexpected result, which explains some observations made by the author in nature, force him to assume a "labile sexuality."—*Author* (*translated by Friedrich Brieger*).

8951. Dangeard, P. **Quelques remarques nouvelles sur le cytoplasme des Spirogyres. [Notes on the cytoplasm of Spirogyra.]** Rev. Algologique 1: 422–426. *2 fig.* 1924 [1925].—Cytosomes (chondriosomes), small granules and drops of oil and fat are described as present in *Spirogyra.*—*Wm. Randolph Taylor.*

8952. Denis, M. **Revue des travaux parus sur les algues de 1910 a 1920.** (Suite.) **[Review of the works appearing on the algae from 1910 to 1920.** (Continued.)**]** Rev. Gén. Bot. 37: 233–240. 1925.

8953. Elenkin, A. A., and M. M. Gollerbakh. **Schema specierum gen. Gomphosphaeriae Kuetz. et Coelosphaerii (Naeg.) nob. emend. [Revision of Gomphosphaerium and Coelosphaerium.]** Ботанические Материалы Института Споровых Растений Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Inst. Crypt. Hort. Bot. Petropolitani] 2: 155–157. 1923.—Diagnoses and observations in Latin are given of the following: *Gomphosphaeria*, including *G. aponina* Kuetz., *Coelosphaerium* (Naeg.) Elenk. et Gollerb. emend., *C. Naegelianum* Unger, *C. Naegelianum* var. *Lemmermanni* Elenk. et Gollerb., *C. lacustre* (Chod.) Elenk. et Gollerb. (*Gomphosphaeria lacustris* Chod.), *C. roseum* Snow, *C. Kuetzingianum* Naeg., *C. dubium* Grun., and *C. reticulatum* Lemm.—*Frederick V. Rand.*

8954. Fritsch, F. E., and Florence Rich. **Contributions to our knowledge of the freshwater algae of Africa. 4. Freshwater and subaerial algae from Natal.** Trans. Roy. Soc. South Africa 11: 297–398. *Fig. 1–31.* 1924.—This is the 1st account of the freshwater and subaerial algal flora of Natal and is based on the examination of 100 different samples collected for the most part in the neighborhood of Maritzburg and in the Drakensberg region. Unless otherwise stated new names are by the authors.—Of the Protococcales, 8 species are described, representing 6 genera, and including 1 new variety, *Scenedesmus quadricauda* (Turp). Breb. var *africana* n. var. The *Ulotrichales* are represented by 8 species belonging to 5 genera. Of special interest is the new genus **Pearsoniella,** characterised by its chloroplasts, which assume the form of a complete ring or girdle encircling the periphery of the cell. The genus is based on *P. variabilis.*—*Schizomeris irregularis* is another new species in this group.—In the Chaetophorales, 2 species are recorded of the genus *Stigeoclonium.* The Oedogoniales are represented by 4 species of *Oedogonium*, including *O. rigidum* Hirn, hitherto only recorded from South America; the Siphonales, by 3 species of *Vaucheria* including 1 new species, *V. pseudo-monoica* n. sp.—The Desmidiaceae are poorly represented, only 1 sample being at all rich in Desmids. Sixty one species are recorded, belonging to 12 genera, and including 3 new species and 7 new varieties, namely, *Euastrum brasiliense* Borge var. *africanum* n. var., *E. elegans* (Breb) Kuetz var *symmetricum* n. var., *E. incertum* n. sp., *Micrasterias Bewsii* n. sp., *M. truncata* (Corda) Breb. var. *africana* n. var., *Cosmarium bewsii* n. sp., *C. javanicum* Nordstedt var. *profundo-constrictum* n. var., *C. mansangense* W. & G. S. West. var. *africanum* n. var., *C. margaritiferum* Menegh. var., *exsertum* n. var., and *C. trachypleurum* Lund. var. *natalensis* n. var. Six species representing 4 genera of the Zygnemaceae are mentioned, including 1 new variety *Spirogyra neglecta* (Hass.) Kuetz. var. *pseudoternata.* The Heterokontae are represented by 3 species; the Cyanophyceae by 49 distributed among 23 genera, and including 6 new species, and 3 new varieties; *Dasygloea amorpha* Berk. var. *africana* n. var., *Microcoleus annulatus* n. sp., *Schizothrix epiphytica* Fritsch n. sp., *Scytonema Bewsii* n. sp., *Scytonema splendens* n. sp., *Stigonema hormoides* Kuetz (Born. et Flah.) var. *africana* Fritsch n. var., *Homoeothrix aequalis* n. sp., *Calothrix gelatinosa* n. sp., and *C. parietna* (Naeg.) Thur. var. *africana* Fritsch n. var.—Two species of the Florideae are recorded, 4 of the Flagellatae and 78 of the Diatomaceae, representing 19 genera and including 2 new species and 3 new varieties: *Synedra amphirhynchus* Ehrenb. var. *fragilariaeformis* n. var., *Navicula mesolepta* W. Smith var. *africana* n. var., *Stauroneis anceps* Ehrenb. var. *lata* n. var., *Gomphonema crassestriatum* n. sp., *Cymbella helvetica* Kuetz. var. *africana* n. var., *Nitzschia hantzschiaeformis* n. sp., and *N. hantzchiaeformis* var. *constricta* n. var.—*E. M. Doidge.*

8955. Fritsch, F. E., and Florence Rich. **Contributions to our knowledge of the fresh-water algae of Africa, 5. On a deposit of diatomaceous earth from Ermelo, Transvaal.** Trans. Roy. Soc. South Africa 12: 277–284. *1 fig.* 1925.—Seventeen species of diatoms have been distinguished in the kieselguhr, the bulk of the deposit being composed of 6, namely, *Epithemia irregularis*, *Navicula elliptica*, *Pinnularia episcopalis* var. *brevis*, *P. major* var. *linearis*, *P. viridis* var. *elliptica* and *Cymbella helvetica.* The complete absence of all diatoms of the centric type, of all colonial forms and of such common genera as *Surirella* and *Synedra*, is noteworthy. One new species has been recognized, *Epithemia irregularis*, with 1 new variety, *E. irregularis* var. *elongata.*—*E. M. Doidge.*

8956. Geitler, L. **Ueber einige wenig bekannte Süsswasserorganismen mit roten oder Blaugrünen Chromatophoren. Zugleich eine Beitrag zur Kenntnis pflanzlicher Chromatophoren. [Little known fresh-water organisms with red or blue-green chromatophores, and a study of plant chromatophores.]** Rev. Algologique 1: 357–375. *11 fig.* 1924 [1925].—*Gymnodinium amphidinioides* is described from Lunz, Austria, as having a blue-green color in the chromatophores.—*Rhodomonas rubra* and *Cryptomonas caerulea* from Lunz and elsewhere have pigments from brown to red in *Rhodomonas* and from blue to olive-green in *Cryptomonas* where the anabolite appears to be close to floridean starch, but with pyrenoids present in many cases, lying outside the chromatophore.—The aquatic *Phorphyridium aerugineum* has a cell structure like *P. cruentum.* The nucleus is excentric and in a depression of the chromatophore, in division the mitotic figure is near the periphery of the cell. *Allogonium smaragdinum* appears as short filaments on other algae. Isolated old cells resemble *Chroococcus*, and may be filled with reserve starch. The cell structure is like that of *Phorphyridium* except that the central connecting mass is reduced or absent. *Phragmonema sordidum* from leaves of *Ficus* in a greenhouse is a short filament of cells with a nucleus and 2–5 peripheral chromatophores of a dirty-violet color. *Glaucocystis nostochinearum* and *Gloeochaete Wittrockiana* are also discussed.—*Wm. Randolph Taylor.*

8957. Gelei, J. v. **Trochisia im Symbiose mit der Larve von Rana agilis. [A Trochisia symbiotic with the larva of Rana agilis.]** Folia Cryptoganica 1: 89–92. *Fig. 1, 2.* 1925.—In the gelatinous sheath of eggs of *Rana agilis* occur numbers of individuals of *Trochisia Zachariasii* Lemm. It is suggested that the symbiotic relation involves an exchange of O_2 and of CO_2 between the *Trochisia* and the frog embryo. The question is raised as to whether the *Trochisia* infects the egg in the uterus or subsequently.—*Wm. Randolph Taylor.*

8958. Hamel, G. **Floridées de France. III.** Rev. Algologique 1: 427–457. *7 fig.* 1924 [1925].—In a continuation of a discussion of the Florideae of France there are described in detail, with full critical and geographical notes, *Erythrotrichia Boryana* (Mont.) Berth., *Neevea repens* Batt., *Porphyropsis coccinea* (J. Ag.) Rosenv., *Rhodochaete parvula* Thuret, *Compsopogon caeruleus* (Balb.) Mont., *Porphyta leucosticta* Thuret, *P. umbilicalis* (L.) J. Ag., *Bangia fusco-purpurea* (Dillw.) Lyngb., *B. atropurpurea* (Roth) Ag., *Goniotrichum elegans* (Chauv.) LeJolis, *G. Cornu-Cervi* (Reinsch.) Harv., *Asterocystis ornata* (Ag.) [n. comb?] and *Conchocelis rosea* Batt.—*Wm. Randolph Taylor.*

8959. Hamel, G. **Quelques Cladophora des côtes françaises. III. [Cladophoras of the French coast. III.]** Rev. Algologique 1: 462–470. *Pl. 9.* 1924 [1925].—*Cladophora rectangularis* (Griff.) Harv. and *C. Macallana* Harv. are described, with full critical and geographical notes.—*Wm. Randolph Taylor.*

8960. Howe, Marshall A. **Notes on algae.** Jour. New York Bot. Gard. 25: 175–176. 1924.—This is an abstract of a staff conference report on miscellaneous algae. The occurrence of the aquatic *Nostoc parmelioides* in Connecticut and Nova Scotia is mentioned and it is noted that nearly every thallus contained the larva of a fly. Specimens were exhibited of a peculiar, unicellular green alga (later determined by G. M. Smith as a species of *Palmodactylon*), occupying a layer in the gelatinous envelopes of the eggs of the spotted salamander (*Ambystoma maculatum*). Specimens and drawings were shown of new species of *Pithophora* from Bermuda, and of *Chondrocystis*, *Dichothrix*, and *Protoderma* from the Bahamas which have since been published. Several calcareous or rock-forming algae, including a marl from a lake-bottom in Michigan, a fossil of the Ellis-Jurassic formation of Montana, and a specimen of an extensive deposit of travertine of Quaternary age bordering the Salton Sea Basin in California, were exhibited and discussed.—*Author.*

8961. Janet, Charles. **Considérations sur l'être vivant. III. La Characée considérée au point de vue orthobiontique. [The Characeae considered from the orthobiontic point of view.]** *1-54 p. Pl. 3.* Dumontier et Hague: Beauvais, 1922.—A full understanding of this paper on the Characeae necessitates a knowledge of the orthobiontic constitution of organisms, both plant and animal, as set forth in Parts I and II already published, (See Bot. Absts. 9, Entry 382; this issue, Entry 9073) and in a further contribution now in preparation. In order to place on trial his new views on the fundamental constitution of living things the author applies these views to the elucidation of a question remaining hitherto unanswered, namely, to the interpretation of the anatomical constitution and the peculiar mode of formation of the spermatozoids in the Characeae. Oltmanns (Morph. u. Biol. d. Algen. 2 Aufl. 1:457. 1922.) sets forth the problem and ends with the statement that only the antheridia, with their peculiar spermatozoid formation, remain unexplained; he knows of no similar condition in the green, brown and red algae and expresses the hope that the future will settle this puzzling question.—The author believes the problem to be solved with precision in the present work, through a consideration of the general orthobiontic constitution of the organism. His conclusions follow: The orthobiont (complete succession of all the formations leading from one given zygote to a new zygote) of the Characeae requires 3 successive generations. In the normal case, representative of the ancestral type, these 3 generations are: (1) asexual; (2) bisexual; (3) unisexual, male. The 1st generation, which was much better developed in the ancestors of the Characeae, has retrograded to the quadricellular condition. Its ontogenesis has realized a reduction in chromosome number. Its proplastid (mother-cell) is the zygospore (Zygote). Its teleplastids (reproductive cells) are 4 "meospores" (spores arising through an ontogenetic reduction) of which only 1 develops.—The 2nd generation has become the principal generation from the point of view of cellular multiplicity and complexity. The ancestral unicellular condition of the segment is now replaced by the bicellular condition. The branching of the segment remains verticillate and very regular but more or less complex. This generation often preserves the primitive, ancestral, bisexual (monoecious)state. Its proplastid is a meospore; its teloplastids are the oospores (oospheres) and androspores. The bisexual individual is dedoubled in certain species (cenogenetic dioecism) into a male and a female individual.—The male individual may, under certain local conditions, fail to appear (*Chara crinita*). In this case there is no longer a 3rd generation, and the oospores (oospheres) bring into play their primitive ancestral aptitude for parthenogenesis, an aptitude which they have preserved. Here the parthenogensis, being gynecogenic ("thelytoque"), continues the orthebiont indefinitely. The 3rd generation is purely male, that is to say, produces spermatids only, having preserved more primitive characters than the 2nd generation. It consists of a filament with a row of unicellular segments. This segment presents 2 ancestral forms of branching, verticillate and dichotomous. Whereas in the 2nd generation the oogones and androgones have become cenangenetically unicellular, in the 3rd generation the spermagones (groups of spermagonia) have preserved the primitive ansestral character in consisting of long filaments of spermagonia.—This division of the orthobiont of the Characeae into 3 successive generations is schematized by the author by means of orthobiontic formulas and by a plate giving a graphic representation of the orthobiont.—*Author* (*translated by F. V. Rand*).

8962. Janet, Charles. **Le Volvox. Deuxième Mémoire.** *64 p. 4 pl.* Les Presses Universitaires de France: Paris, 1922.—This work contains a description of the orthobiont of Volvox, and a comparison of the orthobiont of Volvox with that of the primitive organism and with that of animals. The structures of the egg and of the blastula are described and figured. During the entire ontogenesis of the Volvox blastula the cells remain united by plasmodesmen remaining after division. The spermatozooids arise from the separation of a tabular, cupuliform or spherical spermatogenous blastula. The young spherical spermatogenous blastula is non-motile at the point of its attachment, as a result of the remarkably regular compression and folding of its flagellae. Later, as a result of osmotic growth in the volume of the blastea envelope, the flagellae are released so that the blastula acquires its rotatory motion before being expelled. In *Volvox globator* there is an oogenic blastula which produces ephemeral, abortive eggs and a large functional oospore, which the early arrival of a spermatozoid transforms into a zygospore. In the egg of *V. globator*, the extine is in strands. It is very thick on one side and thinner on the side of its connection with the intine, which is thin and united upon both faces. The nucleus of the egg shows a nuclear membrane, a nuclear sap, lacking in chromatin, a large nucleolus, which is in reality the essential part of the nucleus and contains the chromosomes, a centrosome situated in the nucleolar surface, and a nuclear membrane surrounding the nucleus and the centrosome which is pressed into a depression in the surface of the nucleolus.—*Author (translated by J. M. Fogg, Jr.).*

8963. Janet, Charles. **Le Volvox. Troisième Mémoire. Ontogénèse de la blastéa volvoceienne.** Part 1. *179 p. Pl. 5–21.* Protat Frères. Macon, 1923.—The study of the ontogeny of the Volvocineae presents difficulties resulting from the smallness of the cells and their turgescence which hides their arrangement, yet this study was completed as far as the 10th division stage or the stage of 1024 cells, which is most often the final stage (teleplastid) of *Janetosphaera aurea* (Ehrb.) Shaw. The ontogeny of the volvocean blastula embraces 4 periods. The 1st period begins with the unicellular state of the mother cell, which, depending upon the position which the blastula examined occupies in the orthobiont, may be a zygospore, a meiospore, an agametospore or a pregametospore. It is during this period that all the cellular divisions are accomplished. During the 2nd period a jelly is formed which separates the protoplasts and stretches the plasmodesmen. The 3rd period begins with the liberation of the young blastula which is expelled from the mother blastula. During this period the blastula develops its gonidium or complement of spores. The 4th period starts with the liberation of the progeny. The parent colonies, having completed their function, die and disintegrate. The blastula cover consists of a layer of generally hexagonal, prismatic cells. During the 1st period there is in each stage of division a folding of 2 lateral faces of each cell by the planes of division of the following bipartition stage. With one exception each double bipartition transforms every cell into a lozenge-shaped, plane tetrad. Each of the foldings forms new cell faces of which a certain number are definite faces, never again folded during ontogenesis, while the others are faces which undergo further folding. If, instead of examining entire cells, as we have just done, we confine our study to the usually hexagonal polygons formed by the levelling of the cells at the surface of the blastula, it is found that each division stage gives rise to: (1) New polygonal apices all of which are definite and continuous through ontogenesis; (2) new sides of polygons some of which are definite, while others are later folded by bipartitions; and (3) new polygons, none of which are definite so long as the final bipartition stage is not complete. The ontogenesis of the volvocean blastula is inaugurated by 4 successive bipartitions which lead up to the 16-cell stage in which the blastula presents 4 meridional spindles each consisting of a tetrad of cells. The 5th bipartition gives the 32-cell stage by transforming this tetrad of cells into a tetrad of diads. The 6th bipartition, giving the 64-cell stage introduces the following peculiarity in the ontogenesis of Volvox: The spindle composed of the 4 tetrads presents a "phialoporic" linear tetrad, a median, lozenge shaped tetrad, and a cruciate linear tetrad. The 1st bipartition forms the 1st plasmodesm. The 2nd divides this into 3 new plasmodesmen one of which is definite and not again divided and the 2 others which undergo further divisions. As a rule each bipartition gives new facets, some of which are definitive and each of which are accompanied by a definite plasmodesm, while others are destined for folding and are accompanied by a plasmodesm which later divides to conform to new plasmodesman. Contrary to that which has been accepted by many authors, the 4 cells of the crucial pole divide at each stage of bipartition, but these divisions always give rise to 4 cells which maintain the connection of the crucial pole by 4 cells in the form of a cross.—*Author (translated by J. M. Fogg, Jr.).*

8964. Karsten, G. **Über Diatomeen, ihre Fortpflanzung und verwandtschaftlichen Beziehungen. [Diatoms, their reproduction and taxonomic relationships.]** Internat. Rev. Ges. Hydrobiol. u. Hydrograph 12: 116–120. 1924.—This article reviews the present status of the question of microspore formation and the stage where the reduction division occurs in the Centricae (diatoms). Suggestions are offered concerning the probable time at which reduction occurs in *Melosira*. A parallelism with the Fragilarioideae is drawn, and the study of this latter group is urged, as offering possibilities of throwing light on the affinities of the Centricae and Pennatae.—*Lowell E. Noland.*

8965. Kol, E. **Elömunkálatok a Nagy Magyar Alföld moszatflórájához. 1: Szeged és vidéke. [The algal flora of the Hungarian Nagy Alföld 1: Szeged and vicinity.]** Folia Cryptogamica 1: 65–88. *Pl. 2, 3.* 1925.—Material from soda lakes, lakes rich in humic acids, lakes with sweet water, streams, swamps, etc., were studied. There are listed with critical notes 104 species, of which 78 are new for the Nagy Alföld, and 34 new for Hungary, as follows: *Synechococcus brunneolus* Naeg., *Gloeocapsa granosa* (Berk.) Kg., *Oscillatoria gracillima* Kg., *Spirogyra catenaeformis* (Hass.) Kütz., *S. maxima* (Hass.) Kütz., *S. Reinhardii* Chmiel., *S. reticulata* Norst., *Zygnema chalybeospermum* Hansg., *Z. leiospermum* DeBary, *Z. Ralfsii* (Hass.) DeBary, *Mougeotia quadrangulata* Hass., *Hyalotheca mucosa* (Mert.) Ehrenb., *Chlorosphaera angulosa* (Corda) Klebs., *Chlorococcum olivaceum Rabenh.*, *Characium clava* Hermann, *C. coronatum* Reinsch., *C. Eremosphaerae* Hieron., *C. Naegelii* A. Br., *C. strictum* A. Br., *Oocystis gigas Borgei* Lemm., *O. elliptica* W. West, *O. lacustris* Chodat, *O. Marssonii* Lemm., *O. pelagica* Lemm., *O. rupestris* Kirchn., *Tetraedron muticum* (A. Br.) Hansg., *T. punctulatum* (Reinsch.) Hansg. f. *quadraticum* Reinsch., *Actinastrum Hantzschii* Lagerh., *Trochisia granulatum* (Reinsch) Hansg., *Ulothrix tenerrima* Kütz., *Hormidium flaccidum* A. Br., *Stigeoclonium amoenum* Kütz., *Trentepohlia lagenifera* (Hildebr.) Wille, *Oedogonium Pisanum* Wittr. sec. Hirn.—*Wm. Randolph Taylor.*

8966. Küster, Ernst. **Anleitung zur Kultur der Mikroorganismen. [Guide to the culture of microorganisms.]** *3rd ed. 233 p. 28 [31] fig.* B. G. Teubner: Berlin, 1921.—Cultural directions are given for certain of the colorless and colored flagellates, including *Euglena*, and for the algae proper, including especially *Stichococcus, Scenedesmus, Chlorococcum, Chlorella, Chlamydomonas*, the Volvocales, *Spirogyra, Zygnema, Cosmarium, Porphyridium*, the Bacillarieae, Myxophyceae and Phaeophyceae.—*Wm. Randolph Taylor.*

8967. Lebour, Marie V. **Plymouth Peridinians. IV. The plate arrangement of some Peridinium species.** Jour. Marine Biol. Assoc. United Kingdom n.s. 13: 266–270. *Fig. 1–5.* 1923.—The author describes and figures the plate arrangement in 3 species of *Perdinium*, namely, *P. ovatum* Pouchet, *P. subcurvipes* Lebour n. sp., and *P. claudicans* Paulsen.—*Marshall A. Howe.*

8968. Lemoine, Mme. Paul. **Melobesieae.** Dansk Bot. Ark. 4^7: 36. 1925.—Near and on Beata Island, St. Domingo, there were collected 8 species of *Archeolithothamnion, Lithothamnion, Lithophyllum* and *Melobesia.*—*Wm. Randolph Taylor.*

8969. Mangenot, G. **Sur les communications protoplasmiques dans l'appareil sporogene de quelques floridees. [Protoplasmic communications between the cells of the carposporophyte of some Florideae.]** Rev. Algologique 1: 376–420. *Pl. 6–8, 6 fig.* 1924 [1925].—*Griffithsia Bornetiana* has large pits in the inter-cellular wall region occupied by 2 readily stainable membranes with a lenticular disk of refractive substance between them. In the carposporophyte the plasmodesms are larger near the central part of the gonimoblast mass, becoming much reduced near the free end of the gonimoblasts. In *Nitophyllum laceratum* and *N. Hillae* the plasmodesms are large in the peripheral and central gonimoblasts, with very thick deeply staining discs on each side of a thin flat uncolored membrane. In the central part of the gonimoblasts the plasmodesms are more like those in *Griffithsia. Delesseria Hypoglossum* has a very large intercellular plate with thin stainable membranes on each side of a thin colorless one. In the plants studied, strands of ordinary protoplasm do not traverse the disks described.—*Wm. Randolph Taylor.*

8970. Méheut, M., and P. Verneiul. **Étude de la Mer. [Study of the sea.]** *New Edition. 2 vols., iv + 213 + 199 p., 22 + 28 colored pl., many text figures and unnumbered plates.* Librairie Centrale des Beaux-Arts: Paris, 1924.—This collection of color sketches and drawings of marine life by Méheut is accompanied by a descriptive text by Verneuil. A chapter on marine algae contains a description of the general appearance of the flora of the French coast and is accompanied by drawings of many species and by colored plates of *Fucus vesiculosus, Chorda filum, Chondrus crispus, Ulva, Furcellaria fastigiata, Padina pavonia, Himanthalia lorea, Laminaria saccharina, Delesseria sanguinea, Callophyllis laciniata, Rhodymenia pal-*

mata, Sarcophyllis edulis, Laminaria flexicaulis, Alaria esculenta and *Saccorhiza bulbosa.*—*Wm. Randolph Taylor.*

8971. Naumann, E., and G. Sjöstedt. **Über eine Lagynion- Siderocapsa-artige Struktur in marinen Aufwuchs von Öresund. [A Lagynion-Siderocapsa like structure of marine incrustations at Öresund.]** Lunds. Univ. Arskrift n. f. Avd. 2, 19^{5}: 1–10. 1924.—The material is described as frequent in the Öresund. It resembles crusts of *Lagynion* and *Siderocapsa,* which are frequent in fresh-water. The material at Öresund must be due to physical-chemical agencies, rather than biological ones, although such a structure may be produced partly by the action of iron-precipitating organisms. The general bearing of this conclusion is discussed.—*E. Naumann (translated).*

8972. Oye, Paul van. **Beitrag zur Myxophyceen-Flora von Java. [Contribution to the Myxophycean flora of Java.]** Hedwigia 63: 174–197. 1922.—The author makes a descriptive and classified list of the Myxophyceae, a considerable number of which were collected in plankton material found in the waters of West Java during 1916 and 1917. One hundred forty-eight species and varieties are listed, grouped as follows: 39 Chroococcaceae, 4 Chamaesiphonaceae, 46 Oscillatoriaceae, 24 Nostocaceae, 20 Scytonemaceae, 8 Stigonemaceae, and 7 Rivulariaceae. Two new species, *Chroococcus bataviae* and *Chr. Bernardi,* are described.—*L. H. Tiffany.*

8973. Petersen, Johs. Boye. **Cyanophyceae Marinae. [Marine Cyanophyceae.]** Dansk Bot. Ark. 4^{7}: 11–13. *2 fig.* 1924.—Near Beata Island, St. Domingo, 14 Myxophyceae were dredged, including *Lyngbya majuscula* var. *calyptrata* n. var. and unnamed species of *Spirulina, Lyngbya* and *Plectonema.* In all species the cells of the dried samples showed red contents.—*Wm. Randolph Taylor.*

8974. Petersen, Johs. Boye. **Freshwater Diatomaceae.** [In: Gandrup, Johannes. **A botanical trip to Jan Mayen.**] Dansk Bot. Ark. 4^{5}: 13–21. *Fig. 1–16.* 1925.—From Jan Mayen there were listed 75 diatoms including *Pinnularia Gandrupii* n. sp., *Achnanthes fragillarioides* n. sp. and an undetermined species of *Nitzschia.*—*Wm. Randolph Taylor.*

8975. Pia, J. **Einige Ergebnisse neuerer Untersuchungen über die Geschichte der Siphoneae verticillatae. [Some results of recent investigations of the history of the Siphoneae verticillatae.]** Zeitschr. Indukt. Abstamm. u. Vererb. 30: 63–98. *Chart.* 1922.—The first chapter contains a short account of the geological history of the family Dasycladaceae: Ordovician: Rich flora with primitive genera like *Rhabdoporella, Dasyporella, Vermiporella,* but also with fairly specialised ones, for instance *Coelosphaeridium, Cyclocrinus, Primicorallina, Mastopora,* etc.—Silurian-Mississippian: Largest gap in our knowledge.—Pennsylvanian: *Anthracoporella, Vermiporella, Mizzia,* a genus allied to *Coelosphaeridium.* (It seems now possible to the author, that the last 2 genera do not belong to the Pennsylvanian but to the Permian.)—Permian: See above.—Triassic: No Dasycladaceae are known from the lower Triassic. At the base of the middle Triassic there appears a rich flora with entirely new types, *Macroporella, Gyroporella, Oligoporella, Teutloporella, Diplopora,* etc. In the higher horizons of the triassic formation there seems to be a gradual decrease in variety among the *Siphoneae verticillatae,* at least so far as Europe is concerned. No rhaetic members of the family are as yet known.—Liassic: First appearance in the Mesozoic of species with branched lateral appendages like *Palaeocladus.*—Jurassic: Many different but rare genera: *Conipora, Stichoporella, Triploporella, Goniolina, Petrascula, Actinoporella,* etc.—Lower Cretaceous: Very few representatives of the family: *Munieria, Salpingoporella.*—Upper Cretaceous: First appearance of living genera (*Neomeris, Cymopolia, Acicularia,* etc.) together with remainders of the jurassic flora (*Triploporella.*)—Eocene: Very rich development of the living genera and of extinct ones like *Meminella, Jodotella, Karreria, Uteria, Dactylopora,* etc.—In the higher strata of the tertiary formation most of the *Dasycladaceae* belong to living genera.—The 2nd chapter deals with the phylogenetic development of the different morphologic characters, the general shape, the axial cell, the lateral appendices, the sporangia, etc. It is shown, for instance, that the spores were originally formed in the axial cell. During the triassic period there first appear species with the lateral branches transformed into sporangia. From the Upper Cretaceous upward sporangia are developed as special organs laterally or terminally fixed on the branches. They are characteristic of all the genera of today.—The arrangement of the lateral appendices on the axial cell is an irregular one in all the Palaeozoic and a good deal of the Triassic *Siphoneae verticillatae.* It is only from Jurassic times onward that the presence of whorls seems to be a general character.—The probable relations between all the genera sufficiently well known is shown in a genealogical tree with reconstructions of the algae contained therein.—In the 3rd chapter some conclusions are drawn on the rules governing the above sketched phylogenetic development. First of all it clearly appears that it would have been absolutely impossible to deduce this development from a study of the living species alone. As there are no more than 6 genera of algae from which there are observed any fossil representatives of real scientific value, it seems rather hopeless ever to unravel the true phylogeny of the Thallophyta.—The author lays special stress on the universal importance of parallel development in phylogeny. It seems that practically no genera correspond to only one line of descent. The attempt made in the study of some groups of fossils like the Mammalia and the Cephalopoda to make the genera monophyletic in the most strict sense of the words is considered by the author to be an erroneous one. He believes that phylogeny and systematics are different though related parts of biology and that the units of classification, like genera, families, etc., cannot be identified with the lines of descent.—It seems that the Dasycladaceae always were confined to warmer climates. From the migrations in the course of their geological history it will be possible to argue about the changes of temperature. Cooler periods during the Liassic amd the Paleocene seem to be clearly indicated by our present knowledge.—*Author.*

8976. Rosenvinge, L. K. **Marine algae.** [In: Gandrup, Johannes. **A botanical trip to Jan Mayen.**] Dansk Bot. Ark. 4^5: 21–23. *Fig. 7–8.* 1924.—From Guinea Bay, Mary Muss Bay and Bären Gat on Jan Mayen there are reported 18 algae, including *Protoderma* (?) *amorphum* n. sp.—*Wm. Randolph Taylor.*

8977. Sauvageau, C. **Sur la culture d'une Algue phéosporée épiphyte. [The culture of an epiphytic pheosporic alga.]** Compt. Rend. Acad. Sci. Paris **180:** 1464–1467. 1925.—*Strepsithalia curvata* is grown on *Helminthocladia purpurea,* and *S. Ligorae* is grown on *Liagora viscida* and on *Nemalion lubricum.*—*C. H. Farr.*

8978. Sauvageau, C. **Sur le développement d'une algue phéosporée. [The development of a pheosporic alga.]** Compt. Rend. Acad. Sci. Paris **180:** 1632–1635. 1922.—The plurilocular sporangia do not directly produce a new *Leathesia.* Their zoospores produce plantlets having a monosiphonous filamentous thallus or a creeping monostromata, readily fertile, furnishing plantlets of a second generation of another form. It has not been determined as yet whether these produce a *Leathesia* or if the *Leathesia* appear from a subsequent generation.—*C. H. Farr.*

8979. Scherffel, A. **Zur Frage: "Warum finden sich auf Conjugaten sozusagen keine Bacillariaceen?" [Why Bacillariaceae are not found upon Conjugales.]** Folia Cryptogamica **1:** 45–48. 1925.—Three factors operate to prevent the attachment of epiphytic diatoms to members of the Conjugales: the intercalary growth of the filaments, the influence of excretion-products and the presence of mucilaginous sheaths.—*Wm. Randolph Taylor.*

8980. Skottsberg, Carl. **Marine algae 2. Rhodophyceae. Botanische Ergebnisse der Schwedischen Expedition nach Patagonien und dem Feuerlande. 1907–1909. [Marine algae 2. Rhodophyceae. Botanical results of the Swedish Expedition to Patagonia and Tierra del Fuego 1907–1909.]** K. Svenska Vet. Akad. Handl. 63^8: 1–70. *Illus.* 1923.—The author continues his treatment of the seaweeds collected by him during his expedition to the west coast of Chile, Patagonia, Fuegia, the Falkland Islands and South Georgia. An annotated list of 118 species is given. The following new names and combinations appear. *Iridaea macrodonta* n. sp., *Catenella fusiformis* n. comb. (*C. opuntia* var. *fusiformis* J. Ag.), *Gracilaria pulvinata* n. sp. (*Dumontia fastigiata* Bory var. *minor* in Hohenacker, Algae marinae siccatae n. 282), **Dendrymenia** n. gen. with *D. flabellifolia* n. comb. (*Rhodymenia flabellifolia* (Bory) Mont.), *Delesseria fuegiensis* n. sp., **Microrhinus** n. gen. with *M. carnosus* n. comb. (*Delesseria carnosa* Reinsch), **Pseudophycodrys** n. gen. with *P. phyllophora* n. comb. (*Delesseria phyllophora* J. Ag.), *Phycodrys antarctica* n. comb. (*Delesseria antarctica* Skottsb.), *P. quercifolia* n. comb. (*Delesseria quercifolia* Bory), *P. austrogeorgica* n. sp., **Cladodonta** n. nom. (*Glossopteris* J. Ag. non Brongn.) with *C. Lyallii* n. comb. (*Delesseria Lyallii* Hook. fil. et. Harv.), **Anisocladella** n. gen. with *A. serratodentata* n. comb. (*Delesseria serratodentata* Skottsb.), *Platyclinia fuegiensis* n. sp., *Nitophyllum condensatum* n. comb. (*Delesseria condensata* Reinsch, *Pteridium Ber-*

trandii Cotton), *Corallina chilensis* Dcne f. *delicatula* n. f.—Special attention is given to the histological structure of the Delesseriaceae, and a new and natural arrangement of the genera is suggested. It is also shown that *Griffithsia antarctica* Hook. fil. et Harv., transferred to *Bornetia* by later authors, was rightly placed by Hooker and Harvey. A detailed description of both sporophyte and gametophytes is given.—*Author.*

8981. Woloszyńska, Jadwiga. **Algologische Notizen. [Algological notes.]** Folia Cryptogamica 1: 49–52. *4 fig.* 1925.—Detailed descriptions and figures are given of *Coelastrum scabrum* Reinsch. *Pediastrum biradiatum* Meyen, and *P. Boryanum longicorne* Reinsch f. *glandulifera* n. f.—*Wm. Randolph Taylor.*

8982. Woloszyńska, Jadwiga. **Nowij gatenek (okrzemki) Centronella Rostafinski n. sp. oraz spis ro´lin planktonowych z jezior: Firlejowskiego i Kunowskiego. [New species of "okrzemki," Centronella Rostafinskii n. sp. and index to plankton plants of the lakes Firlejowskie and Kunoskie.]** Rozprawy Wydzialu Matematyczno-przyrodniczego Polskiej Akademji Umiejetności [Bull. Math.-Biol. Dep. Polish Acad. Sci.] Ser. III. 22 A/B: 89–92. *Fig. 1.* 1922 [1923].—*Centronella Rostafinskii* n. sp. is described.—*Frederick V. Rand.*

MORPHOLOGY AND TAXONOMY OF BRYOPHYTES

Alexander W. Evans, *Editor*

(See also in this issue Entries 8443, 8508, 8718, 8719, 8720, 8738, 9582)

9883. Amann, J. **Catalogue des espèces européennes du genre Bryum. [Catalogue of the European species of Bryum.]** Rev. Bryologique 52: 1–16. 1925.—Since the publication of the 2nd edition of Schimper's Synopsis in 1876, the number of described European species of *Bryum* has increased from 74 to over 300. As a preparation for a revision of the species the author lists, both systematically and alphabetically, the 319 species which he recognizes. In the systematic list he arranges them under the subgenera *Ptychostomum* (with 45 species), *Leucodontium* (with 32), *Eucladodium* (with 90), and *Eubryum* (with 152), each subgenus being further subdivided into 4 or more groups.—*A. W. Evans.*

8984. Arnell, H. W. **Die schwedischen Jungermania-Arten. Pflanzengeographische Skizzen. [The Swedish species of Jungermania. Plant geographical sketches.]** Ark. Bot. **19**^{10}: 1–99. *41 fig.* 1925.—The present paper is the 2nd of a series dealing with the distribution of liverworts in Sweden and follows the plan employed in the 1st (see Bot. Absts. 12, Entry 574). The author shows that the genus *Jungermania* was first characterized by Micheli in 1729, although the name had been proposed by Ruppius in 1718. In the older literature the genus embraced a large number of modern genera; in the recent literature it has either been retained for certain groups of species or else abandoned altogether. The author uses it as the equivalent of the genus *Lophozia* Dum., as defined by Schiffner in 1893. He recognizes 39 species for Sweden and groups them under the following subgenera: *Eusphenolobus* (4 species), *Tritomaria* (4), *Barbilophozia* (11), *Dilophozia* (13), *Leiocolea* (6), and *Gymnocolea* (1). One new combination, *J. confertifolia* (Schiffn.) Arn. (based on *Lophozia confertifolia* Schiffn.), is made, and the new var. *proteidea* is proposed under *J. grandiretis* Lindb. Most of the species have long been known in Sweden, but *J. confertifolia* is here reported for the 1st time.—*A. W. Evans.*

8985. Bartram, Edwin B. **Studies in Tortula as represented in southern Arizona.** Bull. Torrey Bot. Club **51**: 335–340. *Pl. 6–7.* 1924.—A critical discussion is given of 7 species of *Tortula*, based largely on material collected by the author in southern Arizona. Of these species, *T. alpina* (Bry. Eur) Bruch, with vars. *propagulifera* Limpr. and *inermis* (Milde) DeNot., is reported for the 1st time from North America. Two other species, *T. aurea* and *T. fragilifolia*, are proposed as new. *T. alpina* and the new species are figured.—*P. A. Munz.*

8986. Buch, Hans. **Neun für Finnland neue Lebermoose. [Nine liverworts new to Finland.]** Acta Soc. Fauna et Flora Fennica 55^{6}: 1–8. 1925.—The following species are reported for the 1st time from Finland: *Calypogeia sphagnicola* (Arn. & Perss.) Warnst. & Loeske, *Cephalozia Francisci* (Hook.) Dum., *Lophozia atlantica* (Kaal.) K. Müll., *L. Binsteadii* (Kaal.) Evans, *L. Muelleri* (Nees) Dum., *Odontoschisma elongatum* (Lindb.) Evans, *Scapania crassiretis* Bryhn, *S. paludosa* K. Müll., and *Sphenolobus exsectiformis* (Breidl.) Steph. It is proposed to make the *Cephalozia* the type of the new genus **Cladopus** (Spruce), based on *Cephalozia* subg. *Eucephalozia* sect. *Cladopus* Spruce.—*A. W. Evans.*

8987. EVANS, ALEXANDER W. **The lobate species of Symphyogyna.** Trans. Connecticut Acad. Arts and Sci. **27**: 1–50. *Fig. 1–13.* 1925.—The author includes *Symphyogyna* in the family Riccardiaceae. Sexual organs borne on unspecialized branches distinguish the genus from *Riccardia, Metzgeria, Hymenophytum* and *Podomitrum* and indicate a relationship with *Pallavicinia.* The species of *Symphyogyna* are most numerous in the Southern Hemisphere. Stephani recognized 56 species and divided them into the *Procumbentes* and the *Dendroideae,* subdividing the 1st group into the *Dentatae,* the *Integerrimae,* and the *Lobatae.* The *Lobatae* seem to be exclusively American and have attracted attention because they are intermediate between strictly thallose forms and those having clearly differentiated stem and leaves. There is great instability in the lobing of the thallus in the different species, and phylogenetic generalizations are unwise. The following 6 species are distinguished, each being described in detail with citation of the specimens examined: *S. apiculispina* Steph., Bolivia; *S. aspera* Steph., Mexico and the West Indies to Bolivia; *S. Brongniartii* Mont., Guatemala and the West Indies to Bolivia; *S. Hochstetteri* Nees & Mont., Juan Fernandez; *S. rubritincta* Evans, Chile; and *S. sinuata* (Sw.) Nees & Mont., Jamaica. *S. rubritincta,* proposed as new, is typified by Dusén's No. 84 from Corral. It has been confused with *S. Hochstetteri* and *S. sinuata,* but is distinguished from all of its allies by a reddish pigmentation, found primarily in the lower part of the plant.—*A. J. Grout.*

8988. GARDET, G. **Note sur Pleuroschisma trilobatum Dum.** Bull. Soc. Sci. Nancy Ser. IV. **2**: 21–23. 1923.—This hepatic is widely distributed in sandy soils at middle and upper altitudes in the mountains of the Vosges [France], but it had not hitherto been found in fruit in France or England. On October 15, 1922, to the southwest of Raon-l'Etape, Vosges, in a large colony of this species isolated stems with well-developed capsules were found. —*A. Chase.*

8989. HERZOG, TH. **Beiträge zur Bryophytenflora von Yünnan. [Contributions to the bryophytic flora of Yunnan.]** Hedwigia **65**: 147–168. *Fig. 1–7.* 1925.—The present report is based on a collection made by S. Ten in the mountains of the Chinese province of Yunnan. The author calls attention to the mixed character of the flora, which contains both Indo-Malayan and circumboreal elements, and presents evidence to show that the region represents the distributional center for the genera *Erythrophyllum* and *Entodon.* The enumeration of species includes 66 mosses and 2 hepatics, definite stations being given under each. Of the mosses the following are proposed as new, Herzog being the authority for the names except where otherwise noted: *Anomobryum proligerum* Broth. & Herzog, *Barbula Tenii, Brachythecium planiusculum* var. *subpiliferum, B. yunnanense, Claopodium fulvellum, Dicranodontium Tenii* Broth. & Herzog, *Erythrophyllum barbuloides, E. hostile, E. pulvinans, E. Tenii, E. yunnanense, Leptohymenium macroalare, Microdus sinensis, Pseudopohlia yunnanensis, Rozea myura, Streblotrichum gracillimum, Thuidium brachymenium,* and *Trichodon muricatus.* The following represent new combinations: *Erythrophyllum atrorubens* (Besch.), based on *Trichostomum atrorubens* Besch., and *E. Wallichii* (Mitt.), based on *Desmatodon Wallichii* Mitt. The new species are described and discussed and 8 are figured.—*A. W. Evans.*

8990. HERZOG, TH. **Neue Bryophyten aus Brasilien. [New bryophytes from Brazil.]** Repertorium Spec. Nov. Regni Veg. **21**: 22–38. *Pl. 9–11.* 1925.—The new species here proposed and described include 14 hepatics and 13 mosses. The hepatics are the following: *Isotachis coilophylla, Lepidozia densa, Mastigobryum mutans, Plagiochila estrellensis, P. guttulata, P. magnistipula, P. organensis, P. pellucida, P. pseudoradicans, P. subbiloba, Scapania organensis, Schisma capillifolium, S. ulophyllum,* and *Symphyogyne Lützelburgii.* The mosses are the following: *Andreaea hamulata, Bryum atroviride, Campylopus arachnoides, C. sphagnicola, Dicranoloma subenerve, Leptodontium laevigatum, Macromitrium atratum, Polytrichadelphus organensis, Rhacocarpus laevigatus, R. obtusus, Rhaphidostegium Lützelburgii, Rhodobryum subrotundifolium,* and *Sterophyllum cataractarum.* The material upon which the new species were based was collected in part by Ph. von Lützelburg in the Province of Rio de Janeiro and in part by F. C. Hoehne in the Province of Sao Paulo. The plates illustrate the *Andreaea* and all the hepatics except the *Scapania.* They are not issued with the article but will probably appear later.—*A. W. Evans.*

8991. Jensen, C. Danmarks Mosser eller Beskrivelse af de i Danmark med Faerøerne fundne Bryofyter. II. Andreaeales og Bryales. Mosses of Denmark, a description of the bryophytes found in Denmark and the Faroe Islands. II. Andreaeales and Bryales.] *8vo. xix + 569 p. Pl. 1–29. 9 fig.* Gyldendalske Boghandel: Copenhagen and Christiania [Oslo], 1923.—The 1st volume of this extensive work on the bryophytes of Denmark and the Faroe Islands appeared in 1915 and included the Hepaticales, Anthocerotales and Sphagnales. The 2nd volume includes the Andreaeales, with 1 genus and 3 species, and the Bryales, with 117 genera and 443 species. Of the 446 species recognized for the regions under consideration, 189 species are known from both Denmark and the Faroe Islands, while 222 are known from Denmark only and 35 from the Faroe Islands only. The author divides the large order Bryales into 4 suborders: Bryinae, with 33 families; Georgiinae, with 1; Buxbaumiinae, with 2; and Polytrichinae, with 1. The families of the Bryinae are treated in the following sequence: Leskeaceae (5 subfamilies, 8 genera, 14 species), Hypnaceae (2 subfamilies, 14 genera, 69 species) Brachytheciaceae (5 genera, 30 species), Lembophyllaceae (1 genus, 2 species), Pterogoniaceae (2 genera, 2 species), Entodontaceae (2 genera, 2 species), Hookeriaceae (1 genus, 1 species), Neckeraceae (2 subfamilies, 3 genera, 5 species), Climaciaceae (1 genus, 1 species), Fontinalaceae (2 genera, 7 species), Leucodontaceae (2 genera, 2 species), Cryphaeaceae (1 genus, 1 species), Hedwigiaceae (1 genus, 1 species), Orthotrichaceae (5 genera, 27 species), Grimmiaceae (3 genera, 22 species), Brachysteliaceae (1 genus, 1 species), Rhabdoweissiaceae (2 genera, 4 species), Dicranaceae (7 subfamilies, 16 genera, 55 species), Leucobryaceae (2 genera, 3 species), Fissidentaceae (1 genus, 8 species), Archidiaceae (1 genus, 1 species), Barbulaceae (5 genera, 30 species), Tortulaceae (6 genera, 24 species), Encalyptaceae (1 genus, 4 species), Funariaceae (3 genera, 7 species), Splachnaceae (2 genera, 4 species), Ephemeraceae (1 genus, 2 species), Schistostegaceae (1 genus, 1 species), Meeseaceae (3 genera, 5 species), Bartramiaceae (5 genera, 12 species), Bryaceae (6 genera, 60 species), Mniaceae (2 genera, 14 species), and Gymnocybeaceae (1 genus, 3 species). The families included under the other suborders are the following: Georgiaceae (1 genus, 1 species), Diphysiaceae (1 genus, 1 species), Buxbaumiaceae (1 genus, 2 species), and Polytrichaceae (4 genera, 15 species). Artificial keys are found throughout the volume, and the species and higher groups are fully described, discussed, and in many cases figured. The following new varieties are proposed: *Amblystegium subtile* var. *dentata*, *Brachythecium rivulare* vars. *cuspidatum* and *gracile*, *B. pseudoplumosum* var. *gracile*, *Bryum lacustre* var. *Fioniae*, and *Tortula subulata* var. *lapidicola*. There are also many new combinations, several of which represent reductions to varietal rank, as the accompanying list indicates: *Amblystegium* Halleri (Sw.), based on *Hypnum Halleri* Sw.; *A. Juratzkanum* var. *atrovirens* (A. Hans.), on *A. atrovirens* A. Hans.; *A. Juratzkanum* var. *pseudosalinum* (Warnst.), on *A. pseudosalinum* Warnst.; *A. serpens* var. *saxicola* (A. Hans.), on *A. saxicola* A. Hans.; *A. Sommerfeltii* (Myr.), on *Hypnum Sommerfeltii* Myr.; *A. stragulum* (Hagen), on *H. stragulum* Hagen; *Barbula brevifolia* var. *lingulata* (Boul.), on f. *lingulata* Boul.; *Brachythecium plumosum* (Huds.), on *Hypnum plumosum* Huds., usually known as *H. salebrosum* (Hoffm.) Br. Eur. and not the same as *B. plumosum* (Sw.) Br. Eur.; *B. pseudoplumosum* (Brid.), based on *H. pseudoplumosum* Brid. and usually known as *B. plumosum* (Sw.) Br. Eur.; *B. velutinum* var. *validum* (C. Jens.), on *H. validum* C. Jens.; *B. viride* (Lam.), based on *H. viride* and usually known as *B. populeum* (Hedw.) Br. Eur.; *Cratoneuron glaucum* (Lam.), on *H. glaucum* Lam.; *C. glaucum* vars. *falcatum* (Brid.), on *H. falcatum* Brid., irrigatum (Zett.), on *H. irrigatum* Zett., and *subsulcatum* (Schimp.), on *H. subsulcatum* Schimp.; *Dichodontium pellucidum* var. *flavescens* (Dicks.) on *Bryum flavescens* Dicks.; *Eucladium aeruginosum* (Sm.), on *Gymnostomum aeruginosum* Sm.; *E. curvirostre* (Ehrh.), on *Pottia curvirostris* Ehrh.; *E. tenue* (Schrad.), on *Gymnostomum tenue* Schrad.; *Eurhynchium Swartzii* var. *distans* (Lindb.), on *Hypnum distans* Lindb., *Hygrohypnum eugyrium* var. *Mackayi* (Schimp.), on *H. eugyrium* var. *Mackayi* Schimp.; *Hypnum intermedium* var. *Cossoni* (Schimp.), on *H. Cossoni* Schimp.; *Isothecium myosuroides* var. *vallis-Ilsae* (Loeske), on *I. myurum* var. *vallis-Ilsae* Loeske; *Platygyrium palatinum* (Neck.), based on *H. palatinum* Neck. and usually known as *P. repens* (Brid.) B. & S.; *Pohlia polymorpha* var. *acuminata* (Hornsch.), on *P. acuminata* Hornsch.; *Pottia Davalliana* (Sm.), on *Gymnostomum Davallianum* Sm.; *Rhacomitrium heterostichum* var. *affine* (Schleich.), on *Trichostomum affine* Schleich.; *Tortella brachydontia* (Bruch), on *Trichosto-*

mum brachydontium Bruch; *T. brachydontia* var. *litoralis* (Mitt.), on *Trichostomum litorale* Mitt.; *T. crispa* (Hedw.), on *Phascum crispum* Hedw.; *T. crispata* (Nees & Hornsch.), on *Hymenostomum crispatum* Nees & Hornsch.; *T. crispula* (Bruch), on *Trichostomum crispulum* Bruch; *T. microstoma* (Hedw.), on *Gymnostomum microstomum* Hedw.; *T. rutilans* (Hedw.), on *G. rutilans* Hedw.; *T. squarrosa* (Nees & Hornsch.), based on *Hymenostomum squarrosum* Nees & Hornsch, and not the same as *T. squarrosa* (Brid.) Limpr.; *T. tenuirostris* (Hook. & Tayl.), on *Weissia tenuirostris* Hook. & Tayl.; *T. viridula* (L.), on *W. viridula* L.; *T. viridula* vars. *amblyodon* (Brid.), on *W. amblyodon* Brid., and *densifolia* (Wils.), on *W. dens ifolia* Wils. At the close of the volume the author corrects or revises some of the statements in the 1st volume, dealing particularly with the genera *Martinellia* and *Cephaloziella.—A. W. Evans.*

8992. Mühldorf, Anton. **Zur Anatomie der unterirdischen Organe bei den Laubmoosen. [The anatomy of the underground organs of mosses.]** Ber. Deutsch. Bot. Ges. **42**: 330–337. *Fig. 1–2.* 1924.—The paper is divided into 2 parts, the 1st describing the "rhizome" of *Polytrichum commune* and the 2nd the rhizoid-strands of *Catharinea undulata.* The author, who does not regard the subterranean stems of the *Polytrichum* as true rhizomes, finds that their structure varies somewhat according to the nature of the substratum. The most marked contrasts are between plants growing in open bogs and those found in clayey soils and dry forest bogs. In localities of the latter character the subterranean stem is distinguished (1) by its lack of specialized skeletal tissue, the extensive central cylinder giving a certain amount of rigidity; (2) by the smaller lumina of its cells; (3) by the absence of hypodermal strands; and (4) by the cylindrical form of the central cylinder, this being usually 3-lobed in cross-section in plants from open bogs. Some of the rhizoids in the *Catharinea* form rope-like strands, the cell-walls being more or less coalescent. The most important function of these strands is to give rise to adventive shoots, thus serving as a means of vegetative propagation. The anchorage of the plant to the substratum and the taking in of water, which are here secondary, seem to be the only functions of the similar rhizoid-strands of *Polytrichum.—Hally Jolivette Sax.*

8993. Röll, Julius. **Fünfter Beitrag zur Moosflora des Erzgebirges. [Fifth contribution to the moss flora of the Erz Mountains.]** Hedwigia 64: 203-277. 1923.—The first 3 contributions to the moss flora of the Erz Mountains, between Saxony and Czecho-Slovakia, were published prior to 1918; the 4th has been abstracted [see Bot. Absts. 1, Entry 759]. The present contribution is made up largely of lists of Sphagna from 8 different localities in the region under consideration. These include not only the species represented but also the varieties and subvarieties. From the 1st locality, for example, 20 species, 119 varieties and 211 subvarieties are distinguished, and the lists from the other localities are equally detailed. The paper corrects also a few of the records for true mosses in the earlier contributions.—*A. W. Evans.*

8994. Schade, A. **Bemerkungen zu Warnstorfs Arbeit über "die europäischen Artgruppen der Gattung Calypogeia Raddi (1820)." [Remarks on Warnstorf's article on "the European species-groups of the genus Calypogeia."]** Hedwigia 65: 1–10. 1923.—The author shows that certain of the groups of species of *Calypogeia* proposed by Warnstorf in a paper published shortly before his death were based on variable and untrustworthy characters. He maintains that *C. Neesiana* (Massal. & Carest.) K. Müller, although included by Warnstorf under *C. Trichomanis* (L.) Corda, is amply distinct and that *C. trichomanoides* Warnst. really represents *C. Trichomanis,* as this species is ordinarily understood. He maintains further that *C. ambigua* Warnst. is the same as *C. Neesiana* var. *repanda* (K. Müll.) Meylan, that Warnstorf's interpretation of *C. Mülleriana* Schiffn. and *C. fissa* Raddi are at variance with the views usually held, and that *C. variabilis* Warnst. is a subaquatic form of *C. Trichomanis.* The author's conclusions are based upon the study of specimens cited by Warnstorf. —*A. W. Evans.*

8995. Stephani, Franz. **Species Hepaticarum.** Vol. 6. *P. 449–496.* 1924.—The author here continues the appendix to the entire work which he began in the preceding 2 instalments of the present volume (see Bot. Absts. 14, Entries 2766 and 3611). Four genera are taken up in the following sequence, the number of species described being indicated in each case: *Calypogeia* (conclusion), 11; *Mastigobryum,* 108; *Micropterygium,* 1; and *Schistochila,* 19. The geographical distribution of the species is as follows: Asia, 35; Africa, 6; tropical North America, 3; South America, 22; Pacific Islands (including Australia), 73. The following species are apparently described for the 1st time, Stephani being the authority except where otherwise noted: *Calypogeia latissima* (Philippine Islands), *C. longifolia* (Madagascar), *C. minutistipula* (Hawaii), *C. pacifica* (Hawaii), *C. pusilla* (India), *C. repandifolia* (Seychelles Islands), *C. sendaica* (Japan), *C. Suringarii* (Dutch Guiana), *C. viridis* (Japan), *Mastigobryum aberrans* (New Guinea), *M. amboinense* (Amboina), *M. aneityense* (New Hebrides), *M. angustum* (New Caledonia), *M. Aoyagianum* (Japan), *M. asperistipulum* (Guatemala), *M. asymmetricum* (New Guinea), *M. aterrimum* (New Guinea), *M. azuayense* (Ecuador), *M. bamburepens* (New Guinea), *M. biapiculatum* (Hawaii), *M. bispinosum* (Hawaii), *M. Boschianum* (Reunion), *M. brevidens* (Japan), *M. capillare* (New Caledonia), *M. columbicum* (Colombia), *M. conistipulum* (New Hebrides), *M. consociatum* (New Caledonia), *M. confertissimum* (Samoa), *M. coreanum* (Corea), *M. crenatistipulum* (Penang Island), *M. cucullifolium* (Philippine Islands), *M. dentistipulum* (Australia), *M. dognyense* (New Caledonia), *M. ecuadorense* (Ecuador), *M. Elmeri* (Philippine Islands), *M. erosistipulum* (Hawaii), *M. falcifolium* (Samoa), *M. fragile* (Philippine Islands), *M. Francanum* (New Caledonia), *M. gedeanum* (Philippine Islands), *M. gibbifolium* (Japan), *M. gracillimum* (Australia), *M. grossidens* (Hawaii), *M. Gunnianum* (New Hebrides), *M. hebridense* (New Hebrides), *M. heterophyllum* (Ecuador), *M. honoluluense* (Hawaii), *M. Hunsteinii* (New Guinea), *M. Iishibae* (Japan), *M. incrassatum* (New Caledonia), *M. indigenarum* (New Hebrides), *M. insulare* (Philippine Islands), *M. integristipulum* (Pacific Islands), *M. kalihiense* Beauverd (Hawaii), *M. koyasanum* (Japan), *M. Lacouturei* (Madagascar), *M. laxifolium* (East Africa), *M. Ledermannii* (New Guinea), *M. Leratii* Beauverd (New Caledonia), *M. limbatum* (New Caledonia), *M. Londbergii* (New Guinea), *M. Longanum* (India), *M. longifolium* (New Guinea), *M. luzonense* (Philippine Islands), *M. madagassum* (Madagascar), *M. mindanaum* (Philippine Islands), *M. minutidens* (Philippine Islands), *M. minutiserrum* (Philippine Islands), *M. minutitextum* (New Guinea), *M. multidens* (New Guinea), *M. muscicola* (New Guinea), *M. Newellii* (Hawaii), *M. nipuranum* (New Guinea), *M. Novae Guinae* (New Guinea), *M. obtusidens* (Hawaii), *M. Okamuranum* (Japan), *M. orientale* (India), *M. pacificum* (Hawaii), *M. palmicola* (New Guinea), *M. Perrotanum* (Madagascar), *M. pusillum* (India), *M. quadratum* (New Caledonia), *M. Quelchii* (Guiana), *M. repandifolium* (Hawaii), *M. repandistipulum* (Penang Island), *M. ribehanum* (New Guinea), *M. Rockii* (Hawaii), *M. rudimentare* (Hawaii), *M. ruficaule* Beauverd (New Guinea), *M. rupicola* (India), *M. Schraderbergii* (New Guinea), *M. squamulistipum* (Sumatra), *M. subhamatum* Beauverd (Japan), *M. subhyalinum* (Borneo), *M. subligulatum* (Sumatra), *M. subserrifolium* Beauverd (New Caledonia), *M. subsandei* (Hawaii), *M. tamiense* (New Guinea), *M. tantalum* (Hawaii), *M. tenax* (New Caledonia), *M. tjiburrum* (Java), *M. trinitatis* (Trinidad), *M. Turkheimii* (Guatemala), *M. typicum* (Java), *M. upolense* (Samoa), *M. varians* (New Caledonia), *Micropterygium setosum* (New Guinea), *Schistochila flavicans* (New Caledonia), *S. grossitexta* (New Caledonia), *S. hebridensis* (New Hebrides), *S. incrassata* (New Caledonia), *S. integerrima* (New Hebrides), *S. lacerata* (New Guinea), *S. longifolia* (New Hebrides and Java), *S. maxima* (Philippine Islands), *S. paucidens* (New Guinea), *S. ramentacea* (New Guinea), *S. Schultzei* (New Guinea), *S. spinosa* (Tasmania), *S. truncatiloba* (Samoa), and *S. viridis* (New Caledonia). Of these species *Mastigobryum gedeanum* is apparently a homonym since there is an older *M. gedeanum* Steph. of Java. For the various genera here treated the species recognized by the author now total as follows: *Calypogeia*, 79; *Mastigobryum*, 444; *Micropterygium*, 10; and *Schistochila*, 102.—*A. W. Evans.*

8996. Wheldon, J. A. **Acrocladium cuspidatum and its varieties.** Lancashire and Cheshire Nat. **1924**: 5–8. 1924.—The author notes that *Acrocladium cuspidatum* is perhaps the commonest of the British Hypna and describes the distinctive features of the species. In addition to the new var. *typicum*, which includes the more typical forms of the species, 6 varieties are recognized, vars. *filescens*, *submersum* Holt, and *turgescens* being proposed as new. Under var. *typicum* 3 new forms are described, while a 4th form (f. *molle*) is based on *Hypnum cuspidatum* var. *molle* Klinggr.—*A. W. Evans.*

MORPHOLOGY AND TAXONOMY OF FUNGI, LICHENS, BACTERIA, AND MYXOMYCETES

H. M. Fitzpatrick, *Editor*

J. E. Flynn, *Assistant Editor*

(See also in this issue Entries 8357, 8378, 8383, 8389, 8419, 8453, 8508, 8729, 8788, 9091, 9105, 9127, 9146, 9161, 9287, 9289, 9413, 9489)

FUNGI

8997. Anonymous. **Indian bread or Tuckahoe.** Missouri Bot. Gard. Bull. **9**: 71–75. *Pl. 20–21.* 1921.—A resumé is presented of the facts known concerning *Pachyma cocos.*—*O. T. Wilson.*

8998. Abbott, Howard C. **An easy method of mounting superficial fungi for study.** Phytopathology **15**: 245–256. 1925.—A camels hair brush is dipped into glycerin jelly and a thin coat spread on a warm slide. After the jelly has hardened, the plant part bearing a superficial fungus is pressed against the jelly and removed, leaving a large part of the fungus in position in the glycerine jelly.—*B. B. Higgins.*

8999. Barnett, E. C. **Rhizomorphs in drain.** Trans. British Mycol. Soc. **10**: 230. *Pl. 13.* 1925.—A drain 6 inches in diameter and 13 feet below ground was found to be filled by the unidentified rhizomorphs of a fungus.—*W. B. McDougall.*

9000. Baxter, Dow V. **Fomes fraxineus in culture.** Papers Michigan Acad. Sci. **4**: 55–66. *Pl. 3–8.* 1925.--Fresh fruit bodies of *Fomes fraxineus* were used as the source of the culture material. After washing, the exterior was removed and portions of the context placed upon malt-extract agar in Petri dishes. Growth started in about a week. From these cultures small portions of mycelium were transferred to thick slants of the same agar in wide-mouthed Erlemmeyer flasks. After the mycelium had covered the surface, wood blocks were placed on the agar. These were from heart wood of white ash (*Fraxinus americana*) and were air-dried and then autoclaved several hours with the addition of considerable water. These sterile blocks were placed so that the transverse, tangential or radial surface was in contact with the agar and its coating of mycelium. A little sterile water was then added. Growth into, as well as upon, the wood block was rapid. In some cultures a Poria-like type of sporophore was produced, bearing within the pores subglobose spores, which were not basidiospores but some type of conidia. All the cells of the wood blocks were eventually traversed by the hyaline hyphae. The walls were only slightly delignified.—*Ernst A. Bessey.*

9001. Bessey, Ernst A. **The relationships of the Ascomyceteae, Basidiomyceteae and Teliosporeae.** Papers Michigan Acad. Sci. **4**: 67–80. *Fig. 3.* 1925.—These 3 classes possess structures which show such close parallelism in their origin and nuclear behavior that they must be held to be homologous. These are, respectively, the ascus, basidium and teliospore. Owing to the differences between the forms with true basidia and the Uredinales and Ustilaginales, which produce promycelia from their teliospores, the 2 latter orders are kept as a separate class, instead of being merged with the Basidiomyceteae, as is often done. The Ascomyceteae include forms which by their possession of trichogyne, non-motile free sperms, ascogenous hyphae growing out from the oogone, and other characters, indicate a relationship to the Florideae, or perhaps, better, to the ancestral stock from which these have arisen. Therefore, the Laboulbeniales are placed as the most primitive, leading to no other group. The Lecanorales (apothecial lichens) and possibly the Pyrenulales (perithecial lichens) would be the groups from which, respectively, the higher, non-lichenous apothecial orders (Pezizales, Tuberales, Helvellales and Exoascales) and the non-lichenous perithecial orders (Sphaeriales, including Hypocreales, Hemisphaeriales, Pseudosphaeriales, Perisporiales, Hysteriales, Aspergillales and Saccharomycetales) have arisen. The Uredinales and Ustilaginales (Class Teliosporeae) are believed to have arisen from the Ascomyceteae, perhaps from the Pezizales, the aecium being looked upon as a modified apothecium, or perhaps from the more primitive Sphaeriales in which a spermagonium is still to be found, this having given rise to the pycnium of the rusts. The Auriculariales can not have arisen from the Uredinales because of their possessing clamp connections which are lacking in the rusts.

They may, however, have had a parallel development from some of the Ascomyceteae. On the other hand they may have arisen entirely apart from the Teliosporeae, as an offshoot from the true Basidiomyceteae. The latter are believed to be best arranged by placing the Hymenogastrales as the most primitive order, from which have radiated the Sclerodermatales Lycoperdales (and allied Nidulariales), Phallales and Agaricales. The Agaricaceae are considered as the most primitive of this last order, having been derived possibly from Secotium-like ancestors. From the Agaricaceae have arisen the Polyporaceae and Boletaceae, and from these the Hydnaceae, Thelephoraceae, Clavariaceae and finally the Exobasidiaceae. From some fleshy Clavariaceae or Thelephoraceae, by partial or complete splitting of the basidium, have arisen the Dacryomycetales and Tremellales. Here would be sought the origin of the Auriculariales if they belong to the true Basidiomycetous series.—*Author.*

9002. Bijl, Paul A. van der. **A fungus—Gibellula Haygarthii sp. n. on a spider of the family Lycosidae.** Trans. Roy. Soc. South Africa **10**: 149–150. *4 fig.* 1922.—This new species is described and illustrated.—*E. M. Doidge.*

9003. Bijl, Paul A. van der. **Descriptions of additional South African Polyporaceae.** South African Jour. Sci. **21**: 308–313. 1924.—A list of South African Polyporaceae, presented to the 1920 meeting of the South African Association for the Advancement of Science, may now be extended by the addition of a number of species. These including 4 new species, are recorded and described, namely, *Daedalia fuscospora, D. ligneotexta* n. sp., *D. quercina, Hexagona albida, H. macrotrema. Laschia rubella, Polyporus adustus, P. Emerici, P. gallo-pavonis, P. meleagris. P. nigro-applanatus* n. sp., *P. ostreiformis, P. Pocula, P. Schrenderi* n. sp., *P. Telfairii, P. vittatus, P. vicinus, P. australiensis, P. glaucoporus, Trametes sepium, T. hystrix,* and *T. salebrosa* n. sp.—*E. M. Doidge.*

9004. Bijl, Paul A. van der. **Notes on some South African Xylarias.** Trans. Roy. Soc. South Africa **11**: 207–208. 1924.—Descriptions are given of 4 species of *Xylaria* occurring in South Africa, *Xylaria castorea* Berk and *X. variabilis* Currey, collected at Durban; and *X. corniformis* Fr. and *X. tabacina* Kickx, from Knysna.—*E. M. Doidge.*

9005. Bisby, G. R. **Zonation in cultures of Fusarium discolor sulphureum.** Mycologia **17**: 89–97. *Pl. 8.* 1925.—This Fusarium, isolated from potato tubers, was found to produce no zonation in cultures grown in darkness or in continuous light. Zones were, however, produced when the cultures were exposed to alternate light and darkness. An exposure to bright daylight for ¼ to ½ second induced the production of a zone of conidia visible to the unaided eye; this zone occurred where the light struck the tips of the spreading hyphae. A 6 minute exposure to the light from a 25-candlepower carbon lamp at 1 m. distance, or a 2 to 2¼ minute exposure to a tungsten filament lamp of about the same candle power, were required to induce the production of a noticeable zone or ring of conidia. The phenomenon appears to be a case of the effect of light upon growth, the light resulting in the localization of the production of conidia.—A somewhat different type of zonation may be brought about by alternating temperature in constant darkness.—*Author.*

9006. Bresadola, G. **New species of fungi.** Mycologia **17**: 68–77. 1925.—From material sent to the author by James R. Weir, 5 new species of *Corticium,* 1 new variety of *Gloeocystidium,* 5 new species of *Peniophora,* 2 of *Aleurodiscus,* 2 of *Odontia,* 1 of *Hydnum,* 2 of *Merulius,* 2 of *Ganoderma,* 2 of *Polyporus,* 1 of *Polystictus,* 3 of *Trametes,* 8 of *Poria* and 1 of *Lentinus* are described. Many of the collections were from the Western States [U. S. A.], but some are from the Eastern States, South America, Africa, and Cuba.—*G. R. Bisby.*

9007. B[rooks], F. T. [Rev. of: Buller, A. H. Reginald. **Researches on fungi, Vol. 2 and 3.** *xii + 492 p.* 1922; xii + 611 p. Longmans, Green & Co.: London, 1924.] Trans. British Mycol. Soc. **10**: 230–231. 1925.

9008. Cappelletti, Carlo. **Studi su la vegetazione resinicola.** [**Studies on the resinicolous flora.**] Ann. Bot. [Rome] **16**: 253–296. *Pl. 7.* 1924.—This is an extensive study of the cryptogamic flora of the resin of conifers and more especially of the manner of growth of this flora on this particular substratum. The following forms were isolated and studied: (1) Fungi exclusively resinicolous. Dematiaceae—*Torula Resinae* Lindau, *T. resinicola* Peyronel; Stilbaceae—*Stysanopsis Resinae* (Fr.) Ferraris; Sphaeropsidales—*Coniothyrium Resinae* (Sacc.) Berl., *Zithia Resinae* (Ehrb.) Karst; Pezizinae—*Biatorella Resinae* Mudd, *Biatorella difformis* (Fr.) Wainio. (2) Fungi not exclusively resinicolous. Dematiaceae—

Helminthosporium Resinae Bres.; Perisporiales—*Limacinia Resinae* (Sacc.) Bres.; *Lichene resinicolo.* (3) Resinicolous fungi probably saprophytic on other resin fungi. Stilbaceae—*Stilbella Resinae* (Bres. Sacc.) Lindau. (4) Fungi terricolous-resinicolous. Perisporiaceae —*Testudina terrestris* Bizz.—Cultivation of many of these forms in vitro has shown that they possess a resistance to turpentine which makes selective cultures possible. *Torula Resinae* shows a remarkable polymorphism. The resin is not utilized as food but impurities contained in it serve as such. The resin is invaded when it is soft and rich in turpentine, the presence of the latter inhibiting the growth of other saprophytes.—*P. D. Caldis.*

9009. Colley, Reginald H. **A biometric comparison of the urediniospores of Cronartium Ribicola and Cronartium occidentale.** Jour. Agric. Res. **30**: 283–291. *Fig. 1–4.* 1925.—An analysis of measurements of 3000 urediniospores of *Cronartium ribicola* and *Cronartium occidentale* indicates that the 2 species may be separated in the uredinial stage with practical certainty on the basis of spore size, spore shape, and thickness of spore wall. The most important criteria for biometric diagnosis are the mean length, the mean wall thickness, and the ratio, mean length divided by mean width. The dimensions of urediniospores produced under greenhouse conditions do not appear useful for distinguishing the 2 species. The data presented are applicable only when the conditions of mounting, measuring, and analysis are strictly comparable.—*Author.*

9010. Corfec, P. **Flore Mycologique de la Mayenne.** Bull. Mayenne Sci. 1923.—This paper is a continuation of an extensive list of fungi collected in Mayenne.—*M. Denis.*

9011. Cunningham, G. H. **The structure and development of two New Zealand species of Secotium.** Trans. British Mycol. Soc. **10**: 216–224. *Pl. 11–12.* 1925.—Studies were made of *Secotium erythrocephalum* and *S. novae-zelandiae.* The early developmental stages resemble those of *Agaricus* while the later stages resemble certain genera of the Hymenogastraceae. The author concludes that the genus should be retained in the Gasteromycetes, preferably in a distinct family, the Secotiaceae.—*W. B. McDougall.*

9012. Dickson, B. T. **Taxonomic studies of the organism causing black-dot disease of potato.** (Abstract.) Phytopathology **15**: 300. 1925.—The organism should be known as *Colletotrichum atramentarium.*—*B. B. Higgins.*

9013. Dufour, L. [Rev. of: Coker, W. C. **The Clavarias of the United States and Canada.** *209 p.* Univ. of North Carolina Press: Chapel Hill, North Carolina, 1923 (see Bot. Absts. 14, Entry 4479).] Rev. Gén. Bot. **37**: 95–96. 1925.

9014. Exell, A. W. **An investigation of the hymenium of three species of Stereum.** Trans. British Mycol. Soc. **10**: 207–215. *Fig. 1–9.* 1925.—The structure of the fructifications, and especially the hymenium layer, of *Stereum purpureum, S. hirsutum,* and *S. sanguinolentum* are discussed and figured.—*W. B. McDougall.*

9015. Fraser, W. P. **Culture experiments with heteroecious rusts in 1922, 1923, and 1924.** Mycologia **17**: 78–86. 1925.—The cultures made in Saskatchewan gave the following results: *Puccinia Clematidis* appears to have a race with aecia on *Actaea* and telia on *Hystrix* and certain Elymi, a race with aecia on *Anemone* and telia on *Agropyron* and *Elymus*, and a race with many-celled teliospores on *Bromus ciliatus* and *B. latiglumis* and aecia on *Thalictrum.* Field evidence suggests also 3 other races of this rust: *Puccinia coronata* on *Calamagrostis inexpanse* was found to produce aecia on *Eleagnus commutata*, and this rust on *Lepargyraea canadensis* infected *Bromus ciliatus, B. Porteri,* and *B. latiglumis.* Aecia on *Rhamnus alnifolia* were cultured to *Calamagrostis canadensis* and *Scholochloa festucacea*, with only weak infection on *Bromus Porteri* and *Avena sativa.* Aecia from *Rhamnus cathartica* infected *Avena sativa* and *A. fatua*, with weaker infections on other grasses. *Puccinia subnitens* was cultured from *Distichilis spicata* to *Plantago eriopoda* and *Glaux maritima; Puccinia angustata* was cultured from *Eriophorum angustifolium* to *Lycopus asper;* and *Puccinia Andropogonis* on *Pentstemon acuminatus* was cultured on *Schizachyrium scoparium. Gymnosporangium juvenescens* from *Sabina horizontalis* infected *Amelanchier alnifolia*, and *G. corniculans* was cultured between the same 2 hosts. *Melampsoropsis Pyrolae* was cultured from *Pyrola asarifolia* to *Picea canadensis.*—*G. R. Bisby.*

9016. González Fragosa, R. **Flora Iberica. Uredales. I.** [**Flora of Iberia. Uredinales. I.**] *lxxi + 416 p. 208 fig.* Museo Nac. Cien. Nat.: Madrid, 1924.—This is the 1st volume of a 2-volume monograph of the rusts of the Iberian peninsula in Spain. The volume embraces the genus Puccinia only, though an introduction treating various general subjects is included. Each species is fully described, synonomy is given, literature cited, and illustrations provided. A single species, *P. biscutellae,* is described as new. It occurs on *Biscutella stenophylla* and is based in part on *P. cruciferarum* Gz. Frag.—*H. M. Fitzpatrick.*

9017. González Fragosa, R. **Flora Iberica Uredales. II.** [Flora of Iberia. Uredinales. II.] *viii + 421. 174 fig.* Museo Nac. Cien. Nat.: Madrid, 1925.—This is the 2nd and concluding volume, and covers all of the Iberian genera except Puccinia. The method of treatment is identical with that followed in the 1st volume. No new species are described. —*H. M. Fitzpatrick.*

9018. Hu, Hsien Su. **[Collection notes on fungi of Kiangsi.]** Ko-Hsueh [Science-Publ. Chinese Sci. Soc.] **8**: 311–314. 1923.—The writer has collected 18 species of Polyporaceae, 1 of Tremellaceae, 1 of Agaricaceae, and 1 of Hypocreaceae in the province of Kiangsi. The fungi have been identified by C. G. Lloyd and 2 species in the collection are described as new: *Polyporus sinensis* Lloyd, and *Fomes tornatus* Pres. Species like *Daedalea unicolor, Tremella mesentrica* Fr., *Polystictus glabo-velutinus, Fomes hornodermus, Lenzites striata* Swartz, *Polystictus affinis* Nees., *Lenzites repanda* Pres., *Polyporus japonica* Fr., *Isaria sinclairii* Berk., and *Polyporus lignosus* as represented by this material differ to an extent from these species as previously described.—*Chunjen C. Chen.*

9019. Iterson, van, R. A. Went, and Johanna Westerdijk. **Bericht over het Centraalbureau voor Schimmelcultuur van de Koninklijke Academie van Wetenschappen te Amsterdam.** [Report from the Central Bureau for Fungus Cultures, Royal Academy of Sciences, Amsterdam.] Verslag K. Akad. Wetenschepp. Amsterdam **29**: 1047–1066. 1920.—A historical review of the bureau's existence is given from the time of erection in 1900 to the present. A list of cultures of about 900 fungi obtainable at the Bureau is given alphabetically. After each species is mentioned the name of the botanist from whom it was obtained.—*Peter J. Klaphaak.*

9020. John, Adolf. **Peziza domestica Sow., Syn. Pyronema domesticum Sow., der Hausbecherling.** [The house-inhabiting discomycete, Peziza domestica.] Zeitschr. Pilzkunde 1^2: 41–43. 1922.—The occurrence of the above named organism on freshly plastered walls and ceilings in a rebuilt house is reported.—*J. Flynn.*

9021. Kauffman, C. H. **The genus Gomphidius in the United States.** Mycologia **17**: 113–126. *Pl. 12–14.* 1925.—A general discussion of the genus *Gomphidius* and a key to its species are followed by descriptions of and notes on the following undescribed and emended species: *Gomphidius ochraceus* n. sp., *G. subroseus* n. sp., *G. oregonensis* Peck. emend., and *G. visidus* Fr. *columbiana* n. f. Comments are given also on *G. flavipes, G. furcatus, G. glutinosus, G. gracilis, G. maculatus, G. nigricans, G. tomentosus, G. vinicolor,* and *G. viscidus.*—*G. R. Bisby.*

9022. Kauffman, C. H. **The genus Lepiota in the United States.** Papers Michigan Acad. Sci. **4**: 311–344. *Pl. 15–18.* 1925.—The author gives keys to the 7 recognized sections of the genus, namely, Lubricae, Viscidae, Pruinosae, Subclypeolariae, Clypeolariae, Asperae and Procerae-Annulosae. Under each section, keys lead to the recognized species, the ultimate divisions of the keys being short species descriptions. In all, about 127 species are thus keyed out. Succeeding the keys are descriptions of the following new species: *Lepiota olivacea,* from Michigan; *L. fusispora,* from New York and Wyoming; *L. flammeatincta,* from Oregon; and *L. cuneatospora,* from Maryland. Emended descriptions are given for *L. brunnescens* Pk. and *L. pulcherrima* Graff, while a new combination, *Volvaria avellanea* (Clem.) is made for *L. avellanea* Clem. and *Volvaria concinna* Clem. Some of the more critical as well as the doubtful and excluded species are then discussed.—*Ernst A. Bessey.*

9023. Linder, David H. **Observations on the life history of Helicodesmus.** Amer. Jour. Bot. **12**: 259–269. *Pl. 23–24, fig. 1.* 1925.—*Helicodesmus albus* n. sp. was found at Fresh Pond, Cambridge, Massachusetts, on the water-soaked zone of partially submerged and weathered *Salix lucida* twigs extending just above the level of the water. The life history consists of 2 stages: conidial and pseudoparenchymatous. As yet no perfect stage has been found. In addition to normal conidia, abortive conidia are frequently found. The fungus grows well on a wide range of nutrient media, although not on cherry extract solidified with agar, and is little affected by a change in sugars. Growth varies directly with humidity and temperature, and inversely with the amount of light. The fungus is capable of withstanding extremely low temperatures (around 2°F. or −16°C.), and thus may overwinter by means of perennial mycelium or conidia. Culture experiments indicate clearly that conidium-production is dependent on exposure to sunlight. The fungus is apparently rare, having been found only in the type locality. It is differentiated from other members of the group by the fact that its spores proliferate extensively, producing tangled and furcating chains which form large, white, flocculent tufts scattered over the surface of the saturated substratum.—*Author's summary.*

9024. Lohwag, D. Heinrich. **Kritische Bemerkungen zur Luridus-Gruppe. [A critical consideration of the luridus group in Boletus.]** Hedwigia 63: 323–328. 1922.—The author first enumerates the chief diagnostic characters of each of the 3 principal species (*satanus luridus*, and *erythropus*) that he believes should be recognized in the *Luridus* tribe of *Boletus*. In addition to certain anatomical characters separating the 2 latter species he gives also the information that *B. luridus* has been repeatedly shown to be poisonous while *B. erythropus* is harmless. He then proceeds to specify to which of these 3 species should be referred each of about 130 illustrations that have appeared in the literature, not only under these names but also under about 30 synonyms.—*L. O. Overholts.*

9025. McWhorter, Frank P. **Cercospora leaf spot of lettuce.** Phytopathology **15**: 247. 1925.—The author calls attention to the probability that *Cercospora lactucae* Wells is identical with the previously described *Cercospora lactucae* Stevenson.—*B. B. Higgins.*

9026. Murrill, W. A. **Collecting around St. Augustine, Florida.** Mycologia **17**: 127–129. 1925.—Notes on the fungi of the region.—*G. R. Bisby.*

9027. Overholts, L. O. **Mycological notes for 1923.** Mycologia **17**: 108–112. *Pl. 10–11.* 1925.—Notes are given on *Merulius rugulosus* B. & C., *Polyporus fruticum* Murr., *Poria ambigua* Bres., *Cintractia Junci* (Schw.) Trel., *Dictyophora Ravenelii* (B. & C.) Burt (with sclerotia) *Helvella infula* Schaeff., *Sphaeronema acerinum* Peck, and *Mycosphaerella smilacicola* (Cooke) Overh. n. comb.—*G. R. Bisby.*

9028. Petch, T. **Studies in entomogenous fungi. VI. Cephalosporium and associated fungi.** Trans. British Mycol. Soc. **10**: 152–182. *Pl. 10.* 1925.—The following species are discussed in detail, the last 3 being described as new. *Hyalopus Yvonis* Dop., *Spicaria javanica* Bally, *Cephalosporium* (*Acrostalagmus*) *Lecanii* Zimm., *C. coccidicolum* gueguen, *C. longisporium* Petch, *C. coccorum* Petch, and *Spicaria javanica* Bally.—*W. B. McDougall.*

9029. Petch, T. **Studies in entomogenous fungi. VII. Spicaria.** Trans. British Mycol. Soc. **10**: 183–189. *Fig. 1–4.* 1925.—*Spicaria prasina* (Maubl.) Saw. and *S. Araneae* Sawada are discussed in detail. Notes on several other species are added.—*W. B. McDougall.*

9030. Petch, T. **Entomogenous fungi: Additions and corrections.** Trans. British Mycol. Soc. **10**: 190–201. 1925.—This paper consists of notes on various species of entomogenous fungi and is supplementary to earlier contributions.—*W. B. McDougall.*

9031. Petri, L. **Sur les conditions qui influencent la formation des zoosporanges chez le Blepharospora cambivora. [Factors controlling formation of zoosporangia by Blepharospora cambivora.]** Rev. Path. Vég. et Entomol. Agric. **11**: 259–261. *Pl. I.* 1924.—Zoosporangia can be obtained from young hyphae in subcultures recently transferred to new culture media and are most surely obtained in transfers from carrot to a very dilute solution of mineral salts, containing only traces of organic nutrients. The addition of cholesterine to the mineral solutions greatly enhances sporangial formation.—*J. Dufrenoy.*

9032. Ramsbottom, J. **Mushrooms and toadstools.** Trans. British Mycol. Soc. **10**: 226–229. 1925.—This is a talk on edible and poisonous mushrooms broadcast from London Station, Sept. 21, 1923.—*W. B. McDougall.*

9033. Raymond, J. **Périthèces de Microsphaera quercina (Schw.) Burr. observés dans le Sud-Ouest de la France. [Perithecia of Microsphaera quercina in southwestern France.]** Rev. Path. Vég. et Entomol. Agric. **11**: 254–258. *Fig. 1–3.* 1924.—Perithecia are reported from leaves of *Quercus pedunculata* collected in Charentes.—*J. Dufrenoy.*

9034. Sartoris, George B. **Studies in the life history and physiology of certain smuts.** Amer. Jour. Bot. **11**: 617–647. *3 pl.* 1924.—Evidence is presented that *Ustilago Hordei*, *U. Tritici* and *U. Heufleri* can complete their life history saprophytically in artificial culture media. This is probably true of all smuts if the medium is appropriate and conditions are optimum. *Ustilago Zeae*, for example, develops mycelium from secondary spores on glycerin agar, but in *Tilletia Tritici* and *T. foetans* best growth is obtained on heavy oatmeal agar. The effect of various nutrient materials and salts on the development of mycelium, sporidia, secondary spores and resting spores is described. The species studied develop best on a slightly acid medium. They do not ferment sugar. The full life history of *U. Heufleri* is presented for the 1st time. Its mycelium in the host plant is multinucleate until just preceding spore-formation, when it breaks up into binucleate hyphae that segment and round up into binucleate chlamydospores. The 2 nuclei in each spore fuse before the chlamydospore is mature. This spore germinates to produce a 2–4 septate promycelium, which in turn forms sporidia at the septa. The sporidia and secondary spores formed in culture are uninucleate. In old cultures they frequently fuse in pairs, the nucleus and cytoplasm of one passing into the other. When food is exhausted, the mycelium breaks up into segments which may also fuse in pairs and form chlamydospores. The secondary spores may produce hyphae directly, and these may break up into binucleate segments to form chlamydospores. Chalmydospores from both sources can germinate to form promycelia.—*E. W. Sinnott.*

9035. Seaver, Fred J. **Informe del Técnico a cargo de los estudios sobre los hongos de Puerto Rico y las islas virgenes. [Report of studies on fungi in Porto Rico and the Virgin Islands.]** Rev. Agric. Puerto Rico 10^6: 37–43. 1923.—A mycological collecting trip in Porto Rico and the American Virgin Islands is reported.—*John A. Stevenson.*

9036. Seaver, Fred J. **Studies in tropical Ascomycetes. III. Porto Rican cup-fungi.** Mycologia **17**: 45–50. *Pl. 4.* 1925.—*Cookeina tetraspora, Humaria phyllogena, H. Cookeina, Lamprospora salmonicolor, Phillipsia Chardoniana, Ciboria caespitosa, Hysterographium Pithecellobii, Ionomidotis portoricensis, Phialea Cecropiae,* and *P. microspora* are described as new species. Notes are given on 11 other species of Discomycetes collected in Porto Rico.—*G. R. Bisby.*

9037. Shear, C. L., Neil E. Stevens, and Marguerite S. Wilcox. **Botryosphaeria and Physalospora in the eastern United States.** Mycologia **17**: 98–107. *Pl. 9.* 1925.—*Botryosphaeria Ribis* was found upon 17 species of hosts, and *Physalospora Malorum* upon 22 species. The 2 fungi are very similar in the morphology of their perfect stages and in their growth on certain culture media, but the former has *Dothiorella* as its pycnidial stage, while the latter has *Sphaeropsis*. Pycnospores have been produced in pure culture from single ascospores from each of the hosts, and are of great uniformity. The size of the sporocarps in both species varies with the thickness and character of the bark of the host. The ascospores of *Botryosphaeria Ribis* are somewhat smaller than those of the Physalospora, in the former germinating with a short branched germ tube, and in the latter with a long unbranched one. The Botryosphaeria also has a greater development of stromatic tissue than has the Physalospora. —*G. R. Bisby.*

9038. Siemaszko, W. **Grzyby polskie nowe oraz rzadziej spotykane. [Some new or rare fungi in Poland.** Acta Soc. Bot. Poloniae **2**: 269–274. 1924–1925.—One new genus and 6 new species of fungi are described, Siemaszko being the authority unless otherwise stated. They are as follows: **Raciborskiomyces** n. gen., *Raciborsciomyces polonicus* n. sp., *Stomiopeltella caricis* n. sp., *Pyrenochaetina lophodermii* n. sp., *Septoria lupini L.* Kaznowski n. sp., *Schizothyriella juniperi* n. sp., *Titaea bialowiezensis* n. sp.—Special attention is called to *Raciborskiomyces polonicus* Siem. and *Stomiopeltella caricis* Siem., as they both are epiphytic fungi. The former is found in the lowlands, the latter in the mountains.—*H. Czeczott.*

9039. Spangler, R. C. **Cladosporium fulvum.** Bot. Gaz. **78**: 349–352. *Fig. 1–9.* 1924. —Two types of spores were produced in pure cultures of *Cladosporium fulvum* Cke. isolated from greenhouse tomato plants. Near the tip of the fruiting branch small, 1-celled, nearly spherical spores were formed catenulately. These are typical of the form genus *Hormodendron*. Other elongate, 2-celled spores borne on the same hypha are typical of *Cladosporium*. —*S. G. Lehman.*

9040. Stevens, F. L. **Plant disease fungi.** *469 p. 407 fig.* The Macmillan Co.: New York, 1925.—"The aim of this book is to present the more important facts concerning the morphology and taxonomy of the fungous parasites that affect plants of importance in the continental United States, with some discussion, also, of the more significant facts of morbid histology." Although published under an altered title this book is in effect a 2nd edition of the author's "The fungi which cause plant disease." The 2 resemble each other closely in binding, form, topography and content, the text being in the main identical and the illustrations chiefly the same. The bibliographic citations of the older work are eliminated in the new, and the keys to genera are condensed, all genera not treated in the text being omitted from the keys. A certain amount of new material based on recent literature is included. The subject matter is discussed under the following headings: Myxomycetes; Schizomycetes; Eumycetes (Phycomycetes, Ascomycetes, Basidiomycetes); and Fungi Imperfecti.—*H. M. Fitzpatrick.*

9041. STEVENS, NEIL E., AND MARGUERITE S. WILCOX. **The citrus stem-end rot "Diplodia;" its life history and relation to Sphaeropsis malorum.** Phytopathology 15: 332–340. *Pl. 8.* 1925.—In studying the stem-end rot of Citrus fruits produced by *Diplodia natalensis*, it was found that a rot of very similar appearance could be produced by inoculating with *Sphaeropsis malorum.* The close resemblance of the 2 organisms in many characteristics led the authors to make a very careful comparison. In culture the 2 produce mycelia that are very similar during the early stages of growth, but in older cultures characteristic differences occur. The pycnidia of *D. natalensis* are produced in sclerotium-like masses above the surface of the medium while those of *S. malorum* are only slightly raised. *D. natalensis* produces some growth at 37°C. while *S. malorum* grows very little beyond 31°C. The 2 are most readily distinguished by the size, shape, septation, and color of the pycnospores. A Physalospora closely resembling the perfect stage of *S. malorum* was found to be the perfect stage of *D. natalensis;* but the perithecial material was not of sufficient quantity to permit a careful study of its morphology.—*B. B. Higgins.*

9042. THOM, CHARLES, AND ELBERT C. LATHROP. **Psilocybe as a fermenting agent in organic debris.** Jour. Agric. Res. 30: 625–628. 1925.—Bagasse baled at the sugar mills in Louisiana ferments quickly and heats rapidly. After standing 4–6 weeks, bales in the middle of the stack attained a temperature of 62°C. *Monilia sitophila* (Mont.) Sacc. and *Trichoderma* sp. were conspicuous upon the surfaces and in the outer portions of the bales. Mucors were also abundant. On the tops of piles 4–6 weeks old occasional species of *Hypholoma* and *Coprinus* occurred, but there were thousands of caps of a Psilocybe, provisionally determined as *P. atomatoides* Peck. When bales of bagasse bearing mushrooms were split open, strands of mycelium could be followed through the whole thickness (perhaps 2 feet or more). The fermented bagasse was yellowed and the softer tissues partially disintegrated, leaving the fiber more easily isolated for manufacturing purposes. The mushroom was isolated upon laboratory media, and grew and fruited within 2–3 weeks in the laboratory, reproducing the yellowing of bagasse in pure cultures. A description of the Psilocybe from cultures is proposed. The abundance and persistence of mushrooms and their mycelia was cited in connection with this demonstration of their fermenting power as a factor too little studied in the disintegration in masses of organic matter and in soil.—*Charles Thom.*

9043. TORO, RAFAEL A. **Una lista de los pirenomycetes coleccionados en Puerto Rico por F. J. Seaver y C. E. Chardon. [Pyrenomycetes collected in Porto Rico by F. J. Seaver and C. E. Chardon.]** Rev. Agric. Puerto Rico 13: 319–322. 1924.—A list is given of Pyrenomycetes collected in Porto Rico in 1923 by F. J. Seaver of the New York Botanical Garden and C. E. Chardon, Commissioner of Agriculture of Porto Rico, as part of the natural history survey of the Island.—*John A. Stevenson.*

9044. WAKEFIELD, E. M. **The Matlock foray.** Trans. British Mycol. Soc. 10: 129-132. 1925.—This is a brief account of a fungus foray held May 16–20, 1924. A list of the species collected, numbering about 138, is given.—*W. B. McDougall.*

9045. WEHMEYER, LEWIS E. **The perfect stage of the Valsaceae in culture and the hypothesis of sexual strains in this group.** Papers Michigan Acad. Sci. 4: 395–412. *Pl. 19.* 1925.—Mature asci and ascospores were obtained in perithecia of the following Valsaceae grown in pure culture from single ascospores: *Valsa Kunzei* Fr., *Diaporthe albo-velata* (Schw.) Sacc., *D. binoculata* (Ell.) Sacc., and *D. galericulata* (Tul.) Sacc. Perithecial initials containing "Woronin hyphae" were obtained in similar cultures of *Diatrype stigma* (Hoffm.) de Not. and *Eutypella fraxinicola* (Cke. & Pk.) Sacc. The development of the perfect and imperfect stages of these fungi on different media is described in detail. For them it is concluded that the formation of perithecia is not dependent upon the presence of 2 different sexual strains, as has been indicated for certain other Ascomycetes. Since perithecia fail to develop on agar media in some of the fungi tested, but do develop on sterile twigs it seems clear that a definite chemical stimulus or series of stimuli is necessary. The influence of varying degrees of humidity and of temperature is also discussed.—*Ernst A. Bessey.*

9046. Whetzel, H. H., H. S. Jackson, and E. B. Mains. **The composite life history of Puccinia podophyllii Schw.** Jour. Agric. Res. 30: 65–79. *Pl. 1–4.* 1925.—Experimental evidence is presented to show that *Puccinia Podophyllii*, an autecious rust commonly regarded as long cycled, with pycnia, aecia and telia, regularly exhibits also a short cycle habit, dropping out the aecia and usually also the pycnia. Field observations extending over several seasons suggested to the senior author as early as 1912 that the telia commonly observed on the sheath leaves of the bud, on the stem and on the sepals early in the spring arise directly from sporidial infections from overwintered teliospores on the ground as do the aecial lesions which develop later on the leaves. The scattered telial lesions, so general on the leaves during the summer, constitute a 2nd crop arising entirely from aeciospore infection. This unorthodox explanation of the well known sequence of spore forms in this species is in opposition to the explanation offered by Olive, who holds that the early telia and aecia on the one hand and the pycnia on the other arise from independent perennial mycelium. He holds all the aecia to be secondary in character, primary aecia being unknown. Cultural experiments made by the senior author at Ithaca, N.Y., during the spring of 1916 and 1917 and repeated by the junior authors on a more elaborate scale at Lafayette, Indiana during 1917–1921 entirely confirm the senior author's hypothesis. These experiments give no evidence that *P. podophyllii* is either perennial or systemic as maintained by Olive. They show conclusively that the early telia on bud scales, stems and sepals arise directly from mycelium produced by sporidia from overwintered teliospores and are usually not accompanied by pycnia; that the aecia on the leaves, usually accompanied by pycnia, arise from the same source; that the late summer crop of teliospores arise from aeciospore infection, the aecia in all cases being primary in nature; that sporidia from either the early or late crop of teliospores may give rise to either telia or aecia depending upon the maturity of the organs infected, and that telia may develop in association with the aecia arising from the same mycelium as the leaf tissues mature. The authors conclude that *P. podophyllii* exhibits evidence of being in an unstable or plastic condition as to life history and is a rust which still exhibits evidences of the sort of changes which have taken place in the evolutionary development from the complex to the simpler forms of life history.—*Authors.*

9047. Zweigbaum, Z. **Grzyby okolic Skierniewic. [Fungi from the Skierniewic district.]** Acta. Soc. Bot. Poloniae **2**: 275–301. 1924–1925.—The work treats chiefly some parasitic fungi collected in the vicinity of Skierniewic. The more exceptional species are: *Ustilago oxalidis* Ell. & Tracy on *Oxalis stricta; Septoria lupini* L. Kaznowski on *Lupinus polyphyllus*, and *Raciborskiomyces polonicus* Siem. on *Salix* sp.—*D. Szymkiewicz.*

LICHENS

9048. Anders, Josef. **Die Flechten Nordböhmens. III. Nachtrag. [The lichens of Northern Bohemia. Supplement III.]** Hedwigia 63: 269–328. 1922.—Anders has studied the lichens of Bohemia for many years, and the present supplement deals mainly with the crustose species, the foliose and fruticose species having received attention in previous published studies. The lichens are listed in the present paper with localities, substrata, other interesting notes, and descriptions of new species and subspecies. The 291 species listed comprise *Verrucaria* (6), *Thelidium* (1) *Thrombium* (1), *Dermatocarpum* (2), *Endocarpon* (1), *Microthelia* (1), *Arthopyrenia* (6), *Leptorhaphis* (1), *Pyrenula* (2), *Coriscium* (1), *Chaenotheca* (2), *Calicium* (5), *Coniocybe* (1), *Sphinctrina* (1), *Cyphelium* (1), *Arthonia* (9), *Opegrapha* (8), *Graphis* (1), *Chiodecton* (1), *Lecanactis* (2), *Schismatomma* (1), *Thelotrema* (1), *Diploschistes* (2), *Microphiale* (1), *Gyalecta* (1), *Pachyphiale* (1), *Coenogonium* (1), *Rhacodium* (1), *Lecidea* (36), *Catillariae* (5), *Bacidia* (14), *Rhizocarpum* (9), *Baeomyces* (2), *Cladonia* (24), *Stereocaulum* (2), *Gyrophora* (2), *Thelocarpon* (1), *Acarospora* (4), *Thermutis* (1), *Ephebe* (1), *Physma* (1), *Collema* (2), *Leptogium* (3), *Heppia* (1), *Placynthium* (1), *Pannaria* (2), *Psoroma* (1), *Lobaria* (1), *Sticta* (1), *Solorina* (1), *Nephroma* (2), *Peltigera* (5), *Pertusaria* (7), *Leca-*

nora (33), *Ochrolechia* (2), *Icmadophila* (1), *Lecania* (2), *Haematomma* (2), *Phlyctis* (1), *Candelariella* (1), *Candelaria* (1), *Parmeliopsis* (3), *Parmelia* (15), *Cetraria* (2), *Alectoria* (1), *Ramalina* (1), *Blastenia* (3), *Caloplaca*, (8), *Xanthoria* (3), *Buellia* (5), *Rinodina* (6), and *Physcia* (11).—All of the crustose species and 41 foliose and fruticose species are recorded for this area for the 1st time. The whole number of species listed is 291, and the whole number of subspecies is 173. The total for species and subspecies is 464. New species and subspecies described are *Dermatocarpon bachmanni*, *Lecidea hillmani*, *Lecanora erigena*, *Parmelia glomellifera pruinosa*, *Parmelia glomellifera grisea*, and *Cetraria islandica crispatula*.—*Bruce Fink.*

9049. Ciferri, R. **Qualche Lichene dei Monti Sibillini. [Some lichens of the Sibiline Mountains.]** Bull. Soc. Bot. Italiana **1925**: 43–45. 1925.—This is a list of 27 species and varieties of lichens. One new variety, *Lecanora albella* (Pers.) Ach. var. *florescens*, living on pine bark, is described.—*Author (translated).*

9050. DuRietz, G. Einar. **Flechtensystematische Studien. II. Leptogium Sernanderi n. sp. und einige verwandte Arten. [Systematic studies of lichens. II. Leptogium Sernanderi n. sp. and some related species.]** (German with Latin diagnosis.) Bot. Notiser **1922**: 317–322. 1922.—The new species was described from roots and bases of trunks of *Alnus glutinosa*, which had been often inundated in the river Noorsån, and from a similar trunk base of *Salix fragilis* in Säby Lake in the parish of Kvista, Upland, Sweden. The author gives a synospsis of the related species with synonomy, notes, indication of geographical distribution and lists of exsiccatae examined.—*P. A. Rydberg.*

9051. Keissler, C. **Schedae ad "Kryptogamas Exsiccatas" editae a Museo historiae naturalis Vindobonensi (olim Museum Palatinum). [Labels for the cryptogamic exsiccatae edited by the natural History Museum in Vienna.]** Ann. Naturhist. Mus. Wien **38**: 134–149. 1925.—Labels are given for Century 29 of this series. One new species, *Mazosia Ramosii* A. Zahlbr., is described from the Philippine Islands. The new varieties, *Lecanora fragilis* var. *subcentrarioides* A. Zahlbr. from Slovakia, and *Lecanora crassa* var. *subcerebrina* A. Zahlbr. from Moravia, are given and the new name, *Lecanora fragilis* A. Zahlbr. (*Lichen fragilis*, Scop) is applied.—*A. S. Hitchcock.*

9052. Keissler, Karl. **Systematische Untersuchungen über Flechtenparasiten und Lichenoide Pilze. (III. Teil, Nr. 21–30.) [Systematic investigations of lichen parasites and of lichenoid fungi.]** Ann. Naturhist. Mus. Wien **38**: 162–168. 1925.—This is a continuation from volume 34, page 70. New names applied are: *Didymella sphinctrinoides* Sacc. var. *Lesdaini* Keissl. n. var. (Mexico), *Stagonospora Sandstedeana* Keissl. n. sp. (Bohemia), and *Libertiella Xanthoriae* Keissl. n. sp. (Sweden.)—*A. S. Hitchcock.*

9053. Knight, H. H. **Lichens of the Matlock foray.** Trans. British Mycol. Soc. **10**: 132–133. 1925.—A list of 64 species of lichens collected during the spring foray of 1924 is given.—*W. B. McDougall.*

9054. Savich, V. P. **De Diploschistaceis e Kamczatka notula. I. Diploschistes Norm. [Notes on Diploschistes varieties from Kamchatka.]** Ботанические Материалы Института Споровых Растений Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Inst. Crypt. Hort. Bot. Petropolitani] **2**: 76. 1923.—Notes, in Latin, are given on *Diploschistes scruposus* (L.) Norm. and its varieties *vulgaris* Koerb., *terrestris* Pers. and *albissima* Ach.—*Frederick V. Rand.*

9055. [Savich, V. P.] Савич, В. П. **О Лишайннке Cetraria Richardsonii Hook. [Notes on the lichen, Cetraria Richardsonii Hook.]** Ботанические Материалы Института Споровых Растений Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Inst. Crypt. Hort. Bot. Petropolitani] **2**: 189–191. 1923.

9056. [Savich, V. P.] Савич, В. П. **Описание Лишайников семейства Stereocaulaceae из Камчатки. [Stereocaulaceae from Kamchatka.]** Ботанические Материалы Института Спороых Растений Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Inst. Crypt. Hort. Bot. Petropolitani] **2**: 161–175. 1923.—This paper gives observations and diagnoses on Stereocaulaceae collected by the author during 1908 and 1909 including 9 species of *Stereocaulon* and 1 species of *Phyllocaulon* as follows: *S. coralloides* Fr., with f. *intermedium* n. f.,; *S. evolutum* Graewe, with var. *typicum* Th. Fr. f. *sterile* n. f., and var. *fastigiatum; S. paschale* (L.) Fr.; *S. tomentosum*, with f. *glareosum* n. f.; *S. Alpinum* laur., with f. pulvinarium n. f.; *S. incrustatum* Flk.; *S. denudatum* Flk., with var. *genuinum* Th. Fr. and formae *validum* Laur. and *commune* Th. Fr. and var. *pulvinatum* (Schiw.) Flot. with formae *saxicolum* n. f. and *arenarium* n. f., and var. *Vesuvianum* (Pers.) Hepp.; and *S. condensatum* Hoffm.—The 1 species of *Phyllocaulon* is *P. Wrightii* (Tuck.) Wain. Savich is authority for the new forms—*Frederick V. Rand.*

9057. Smith, A. Lorrain. **Recent works on lichens.** Trans. British Mycol. Soc. **10:** 133–152. 1925.—The literature on lichens for the past 2–3 years is reviewed. The subject matter is discussed under the following headings: Symbiosis or parasitism, isidial formation, pleurocarpy and pycnothelizy, disintegration of glass and rocks by lichen thalli, water storage, cells and cell-contents, lichen acids, use of reagents, rate of growth in lichens, substratum, polar lichens, lichens of temperate zones, tropical lichens, geographical distribution, systematic notes. A bibliography of 45 titles is given.—*W. B. McDougall.*

9058. [Tomin, M. P.] Томин, М. П. **Новый вид Лишайника, Buellia Elenkini Tomin sp. nov., собранный в Средней Россий. [A new Buellia from Central Russia.]** (Latin summary) Ботанические Матерналы Института Споровых Растений Главного Ботаническово Сада Р. С. Ф. С. Р. [Notulae Systematicae Inst. Crypt. Hort. Bot. Petropolitani] **2:** 139–140. 1923.—In addition to the discussion in Russian, a Latin description is given of *Buellia Elenkini* Tomin n. sp.—*Frederick V. Rand.*

9059. Uphof, J. C. Th. **The occurrence of purple bacteria as symbionts of a lichen.** Amer. Jour. Bot. **12:** 97–103. *1 fig.* 1925.—Evidence is presented that the red organism associated with the fungus in the lichen, *Chiodecton sanguineum* (Sw.) Waino, is not the alga, *Trentepohlia*, but one of the "purple" bacteria. Both bacterium and fungus were grown independently in culture. No evidence of flagella or of a nucleus was found in the bacterium. The author believes that this bacterial symbiont which he names *Rhodobacterium lichenophorum* may have a photosynthetic function. He changes the name of the lichen to *Rhodobacteriophora* sanguinea.—*E. W. Sinnott.*

BACTERIA

9060. Anonymous. [Rev. of: Prescott, S. C., and C.-E. A. Winslow. **Elements of water bacteriology: with special reference to sanitary water analysis.** *4th ed., rewritten. ix + 211 p.* J. Wiley & Sons: New York; Chapman & Hall: London, 1924 (see Bot. Absts. 13, Entry 6846).] Nature **115:** 415. 1925.

9061. Douin, R. [Rev. of: Janke, Alexander. **Allgemeine technische Mikrobiologie. —I Teil: Die Mikroorganism. (General technical microbiology—Part I: The microorganism.)** *xii + 342 p.* Theodor Steinkopff: Dresden & Leipzig, 1924. (See Bot. Absts. 14, Entry 5498.)] Rev. Gén. Bot. **37:** 94–95. 1925.

9062. Enderlein, Guenther. **Bakterien-Cyclogenie. [Bacterial cyclogeny.]** *viii + 390 p. 330 fig.* Walter de Gruyter & Co.: Berlin, 1925.—The book contains the following 15 divisions: (1) Introduction, (2) Historical summary on bacterial morphology, cytology and development, (3) Comparative cytology of the bacteria, (4) Comparative morphology of the bacteria, (5) Asexual and sexual propagation of the bacteria, (6) Life cycles (cyclogeny) of the bacteria, (7) Outlines of a bacterial classification on a comparative morphological basis, (8) Relations between bacteria and other microörganisms, (9) Relations between bacteria and higher organisms, (10) Importance of bacterial cyclogeny to medicine, (11) Alphabetical list of new morphological and biological terms, (12) Bibliograpny, (13) List of illustrations, (14) List of earlier publications by the author, (15) Subject index. Over 150 new terms are listed and explained in chapter 11. A new classification with not less than 70 genera is proposed in chapter 7.—*F. Löhnis.*

9063. Hinman, Jack J. **Importance of differentiating colon-aerogenes group in examining water.** Amer. Jour. Public Health **15:** 614–619. 1925.—This is a discussion of methods of differentiating fecal and non-fecal strains of bacteria in the bacteriological examination of drinking water, and of the importance to be given the findings under different conditions.—*C. A. Ludwig.*

9064. Marshall, M. S. **Irregular typhoid organisms.** Amer. Jour. Public Health **15:** 652. *1 fig.* 1925.—This is a brief description of atypical strains of typhoid bacilli isolated from certain brilliant green agar medium plate cultures from feces specimens received for diagnosis.—*C. A. Ludwig.*

9065. Norton, John F. **Standard methods.** Amer. Jour. Public Health **15:** 207–208. 1925.—This is a report of a meeting at Detroit, Michigan, Oct. 20, 1924, of the Committee on Standard Methods, appointed by the Laboratory Section of the American Public Health Association. It includes procedure for bacterial examination of drinking water, for Wasserman test, milk examination, examination of shellfish, and various items of committee personnel.—*C. A. Ludwig.*

9066. St. John-Brooks, Ralph, K. Nain, and Mabel Rhodes. **The investigation of phytopathogenic bacteria by serological and biochemical methods.** Jour. Path. and Bact. **28:** 203–209. 1925.—An extensive series of bacteria associated with diseases of plants was studied by these authors by biochemical and serological methods. Cultural appearance on agar was used for a preliminary grouping into (1) fluorescent, (2) yellow, and (3) white organisms, the biochemical reactions within the first 2 groups proving fairly constant. Significant relationships were brought out by the agglutination reaction with immune serums produced by the intravenous injection of rabbits using *Bacillus fluorescens liquefaciens* and *non-liquefaciens* on the one hand and the fluorescent plant organisms on the other. Close serological relationship was shown among the following: *B. delphinii*, *B. lachrymans*, *B. angulatum*, *B. tabacum*, *B. mori* and *B. viridilividum*. *B. marginale* E.F.S. was not shown to have any relationship with the other fluorescent organisms. Close relationship was also shown in case of *B. campestre* (certain strains), *B. malvacearum*, *B. phaseoli* and its variety *sojense*, *B. pelargoni* and *B. vitians*. So far as at present investigated, *B. michiganense*, *B. pruni*, *B. stewarti*, *B. tracheiphilus*, *B. hyacinthi* and *B. lathryi* have no relationship to each other or to other members of the group.—*E. M. A. Enlows.*

PALEOBOTANY AND EVOLUTIONARY HISTORY

E. W. Berry, *Editor*

(See also in this issue Entries 8413, 8439, 8494, 8496, 8498, 8971, 8975)

9067. Berry, Edward A. **A species of Musa in the Tertiary of South America.** Proc. Nat. Acad. Sci. [U. S.] **11:** 298–299. 1925.—Describes the large and characteristic seed of a species of *Musa* from the Tertiary of Colombia.—*Author.*

9068. Berry, Edward W. **Age and area as viewed by the paleontologist.** Amer. Jour. Bot. **11:** 547–557. *16 fig.* 1924.—The author calls attention to the difficulty which the Age and Area hypothesis faces in explaining the extinction of species, at least over parts of their ranges, and cites many examples of plant groups now somewhat limited in extent geographically, which were at one time (as shown by fossil evidence) much more widely dispersed.—*E. W. Sinnott.*

9069. C., H. G. [Rev. of: Berry, E. W. **Tree ancestors.** *275 p. 48 fig.* Williams & Wilkins: Baltimore, 1923 (see Bot. Absts. 13, Entry 1004).] Indian Forest. **51:** 176–180. 1925. —Omissions of certain genera of wide distribution detract from the value of the work.—*E. N. Munns.*

9070. Carpentier, A. **Note sur quelques emprientes de graines et microsporanges de Ptéridospermées provenant du Westphalien du Nord de la France.** [Note on impressions of seed and microsporangia of seed ferns in the Westphalian of the north of France.] Rev. Gén. Bot. 37: 145–156. 1925.—The author calls attention to the presence in the Westphalian of the North of France, (1) of split seed, doubtless polypterous, associated with *Neuropteris heterophylla* Brong, (2) of striated organs, resembling these seed, mixed with sterile fronds of *Neuropteris obliqua* Brong, (3) of many species of *Trigonocarpus* found on the same slab as *Alethopteris*, (4) of microsporophylls, apparently of *Potoniea* and intimately associated with some *Neuropterideae*, (5) of seed identical or very near to *Lagenospermum Kidstoni* Arber, some of which are in their cupules and are referred to *Sphenopteris striata* Gothan, and (6) some microsporangia of the same *Sphenopteris*, frequently grouped in dense inflorescences.—*J. C. Gilman.*

9071. Endô, S. **Nilssonia-Bed of Hokkaido and its flora.** Sci. Rept. Tohoku Imp. Univ. [Geol.] 7^3: 57–72. *Pl. 11–17.* 1925.—The author enumerates the following fossil plants from the Nilssonia bed of the Ishikari Coalfield on Hokkaido: *Pteris frigida* Heer, *Asplenium dicksonianum* Heer (?), c.f. *Adiantum formosum* Heer, *Pecopteris torellii* Heer (?), *Glossozamites* (?) *imanii* n.sp., c.f. *Sphenozamites rogersianus* Fontaine, *Cycadeoidea nipponica* n.sp., *Nilssonia serotina* Heer, c.f. *orientalis* Heer, c.f. *johnstrupi* Heer, *Libocedrus sabiniana* Heer, *Sequoia heterophylla* Velen., *Populus denticulata* Heer, *P. arctica* Heer (?), *Rhamnites apiculatus* Lesq., and *Protophyllum obovatum* Newb. These are regarded as indicating the Senonian (Upper Cretaceous) age of the horizon.—*E. W. Berry.*

9072. Fournier, E. **Les Fayolia sont bien des coques d'oeufs d'Elasmobranches. [The genus Fayolia represents the egg cases of Elasmobranchs.]** Compt. Rend. Sommaire Soc. Géol. France **9**: 128–130. 1925.—The fossil objects referred to the genus *Fayolia* Renault & Zeiller, and not uncommon in the late Paleozoic of France, have occasioned much discussion during the past 60 years. They have usually been considered to represent fossil plants but the present author gives evidence to show that they probably represent the egg cases of an elasmobranch fish related to *Pleuracanthus.*—*E. W. Berry.*

9073. Janet, Charles. **Considérations sur l'etre vivant. II. L'Individualité, la sexualité, la parthénogenèse et la mort, au point de vue orthobiontique. [Individuality, sexuality, parthenogenesis and death, from the orthobiontic point of view.]** *196 p., 1 pl.* Dumontier & Hagué: Beauvais, 1921. (See also Bot. Absts. 9, Entry 382; this issue, Entry 8961.)—The cell is the ultimate unit in the constitution of the merism (plethea and blastea) and, consequently, of the orthobiont. This results from the fact that if it is able to live in the isolated state, each of its elements, separated, is inevitably condemned to death in a very short time.—Not in the anatomical structure of the cell but in the intimate structure of the protoplasm lie the prospective ontogenetic and phylogenetic powers. We recognize the effects of these forces but know neither the determinism nor the processes which produce them.—Ontogenesis is considered in relation to the merism, the generation and the orthobiont. It permits the initiation, continuation and completion of the totality of the processes of cellular multiplication and differentiation which go to make up the merism, the generation, the orthobiont.—The phylogenesis of a line (phylum) of orthobionts may, in a certain measure, be considered as being the ontogenesis of this phylum. In a more restricted sense the phylogenesis of a line of orthobionts is the series of the acquisitions (supplementary onto-epigenesis) which appear in the series of the orthogeneses constitutive of the line considered.—The merisms and the generations present, respectively, among themselves, a certain independence justifying the consideration of the phylogenesis not only of each orthobiont but also of each generation and merism. Thus one may consider, in the Pteridophyte, the phylogenesis of the prothallium and, in the Metazoans, that of the soma. The phylogenetic evolution of the orthobiont admits of the following facts: The pletheo-blasteas, primitively facultative, become obligate; those not becoming obligate disappear completely and finally; the pletheo-blasteas, each of which primitively constitutes one individual, associate themselves in such a manner that a plethea becomes the "onto-stabulaire" of the plethea proceeding from it, which becomes the onto-inquiline.—The amplitude of phylogenesis is afforded in the Metazoans by the preponderating development of the first 3 blasteas of the orthobiont; in the plants (other than Volvocaceae), by the preponderating development of one of the pletheas of the orthobiont, which is the 1st plethea of the orthobiont in the Laminariaceae, the Pteridophyta and the Anthophyta, and which is the 2nd in the Characeae and the Bryophyta.—Contrary to general opinion, sexuality is a property of the initial organism (phyto-zoo-flagellate), of the initial plant (phyto-flagellate), and of the initial animal (zoo-flagellate). Especially is sexuality to be considered as a character of the merism and in the continuity of the orthobiont. In the continuity of the orthobiont, there are to be distinguished the following cases which result from the anticipation of unisexuality: All the merisms are asexual except the last blastea which is bisexual (*Chlorochytrium lemnae);* all the merisms are asexual except the last plethea which is bisexual and the last blastea which is unisexual (*Ulothrix*, Pteridophyte isospore); the asexual merism no longer remains, the first merism of the orthobiont is bisexual and all the other merisms are unisexual (monoecious Fucus, heterosporous Pteridophyta; *Helix*); the anticipation of unisexuality is completed and all the merisms are unisexual (dioecious *Fucus;* dioecious Anthophyta, Insecta, Vertebrata).—The union of a spermo-spore and an oospore into a zygospore takes place in non-parthenogenic animals (mammals) between a spermo-spore of the 1st generation and an oospore of the 1st generation; in Bryophyta, Pteridophyta and Anthophyta between a spermo-spore of the 2nd generation and an oospore of the 2nd generation; in the Fourmi, a type in which parthenogenesis is androgenous, between a spermo-spore of the 2nd generation and an oospore of the 1st; in the Phasma, with a series of *n* successive parthenogeneses which are gynecogenic, between a spermo-spore of the 1st generation and an oospore of the $(n + 1)$ generation; in the case of *Oedogonium nannandrien* and in the Characeae, between a spermo-spore of the 3rd generation and an oospore of the 2nd.—The individual is an important unit, especially from the physiological point of view, but of orthobiontic composition very variable; it may be unicellular; it is generally multicellular and composed of one to several merisms. The composition of the individual may vary with the ontogenetic stage. It may be defined with precision in each type of organisms. This composition either does agree (Characeae, Metazoans) or does not agree (primitive case) with the composition of the orthobiont.—The conception of the orthobiontic constitution of organisms draws its importance from its universal application, its simplicity, its precision and its agreement with the facts.—*Author* (*translated by F. V. Rand*).

9074. Kubart, B. **Ist Tsuga canadensis Carr. im polnischen Interglazial nachgewiesen oder nicht? [Is or is not Tsuga canadensis found in the Interglacial of Poland?]** Oesterr. Bot. Zeitschr. 74: 102–104. 1925.—In the Interglacial of Rakow in Poland, A. Kozlowska found a few pieces of twigs up to 4 years of age, 2-year roots and 5 single conifer needles, determined as belonging to *Tsuga canadensis.* This determination was founded purely on the Kozlowska's presentation together with the accompanying plate and with a checking up of the literature references. Because of the presence of resin canals in the wood of the 1st annual rings of these twigs it follows, however, that such a determination of these remains is not possible, since, according to Jeffrey, not only in *Tsuga* but also in *Abies*, *Pseudolarix* and *Cedrus* the wood of the 1st annual rings is without resin canals. Contrary to the assertion of Kozlowska, resin canals occur in the stem cortex only in *Abies* and *Cedrus*, not in the stem cortex of *Tsuga* and *Pseudolarix.* According to Jeffrey and contrary to Kozlowska no resin canals occur in the root cortex of *Abies*, *Cedrus*, *Pseudolarix* and *Tsuga;* since, moreover, no sclereids or crystal cells are to be found in these remains such as occur in *Abies* and *Tsuga* and in part also in *Cedrus* (the larger cells, however, may be mucilaginous cells), a determination as *Pseudolarix* would be possible, but *Tsuga* is excluded. All 4 of these genera possess in the root a central resin canal; this, however, offers no differentiating character. According to the data at hand the twig remains might perhaps belong to *Tsuga;* the root remains never. As for the needles, they might well be ascribed to *Tsuga* provided that the central cavity is considered as a resin canal; but the specific determination as *T. canadensis* is clearly not admissable. A further, careful investigation of these fossil remains appears highly desirable. —*H. Cammerloher* (*translated by F. V. Rand*).

9075. Lilpop, J. **Flora międzylodowcowa z pod Wlodawy nad Bugiem. [The interglacial flora of Wlodawa on the Bug.]** Bull. Serv. Geol. Pologne 3: 137–144. *Fig. 1.* 1925.—The author lists 34 species of plants from the interglacial deposits at Wlodawa on the Bug. This flora is considered from a geobotanical standpoint.—*Author.*

9076. Lilpop, J. **Materjaly do drzew lignitowych Polski. [The lignites in Poland.]** Bull. Serv. Geol. Pologne 2: 387–401. *Pl. 1, fig. 3.* 1924.—The author presents the 1st results of a critical investigation of gymnospermous woods in Poland, giving the anatomical description of 3 "species" and data concerning their geographical distribution in Europe. A new "species" of *Pinuxylon* is minutely described.—*Author.*

9077. Lilpop, J., and E. Passendorfer. **O utworach interglacjalnych pod Sulejowen nad Pilica. [The interglacial near Sulejów on the Pilica.]** Bull. Serv. Geol. Pologne 3: 145–149. *Fig. 1.* 1925.—This is a short description of a series of fresh-water deposits, containing a scanty flora. The result of the pollen analysis is presented.—*Author.*

9078. Mez, Carl. **Drei Vorträge über die Stammesgeschichte der Pflanzenwelt. [Three papers on the phylogeny of the plant world.]** Naturwiss. u. Landw. 4: 1–44. 1925.—Three highly speculative essays which discuss the nature of the primitive material out of which organisms evolved, the origin of animals from plants, and the genetic relationships of all plants. These are summarized in a genealogical tree which includes both recent and fossil plants, from Schizomycetes to Compositae, and which may be fairly characterized as interesting if true. The direct line of evolution of the higher plants is conceived as from *Riccia* through the Anthoceratales, through the Devonian Psilophytales to *Selaginella—Miadesmia—Walchia—Ullmannia*—the Pinaceae—the Williamsoniales to the Ranales. The last constitute a plexus from which both the Monocotyledonae and most of the Dicotyledonae were derived. Many of the lines, for example, the Graminales, Coniferae, Amentiferae, are regarded as reduction series. The Cordaitales, Ginkgoales, Cycadeoidales and Cycadales are regarded, along with the Marattiales, Osmundales, Marsiliales and Pteridospermae, as the common descendants of the Psilophytales through a common ancestry in some Tmesipteris-like form.—*E. W. Berry.*

9079. Rytz, Walther. **Die Pflanzenwelt der Schieferkohlen von Gondiswil-Zell. [The plant remains of the paper coal of Gondiswil-Zell.]** Beiträge Geol. Schweiz, Geotechn. Ser. 8: 79-101. *Fig. 31-34.* 1923.—This investigation of an extended interglacial deposit of paper coal which was mined to a considerable extent during the coal shortage of the world war, is restricted to the demonstration of plant remains and to a study of the vegetation with the purpose of reconstructing the general vegetation and climate relations existing during the period of deposition. The floristic study yielded 4 gymnosperms, 11 dicotyledons, including *Trapa natans muzzanensis* (the 1st Cisalpine specimen found), 8 monocotyledons, 1 fern, 1 *Lycopodium*, 11 mosses, various algae, including, particularly, numerous diatoms (133 species with several varieties), and 11 fungi. Several parasitic diatoms and fungi are demonstrated for the first time as fossils. Numerous diatoms new to Switzerland were also found. *Anomoeoneis sphaerophora* var. *pseudosculpta* n. var. is described.—The vegetation investigated in several profiles and its succession yielded, up to about the end stages, rather close agreement with the present relations in this region of the Swiss Midland. The end stages, however, deviated considerably, since on the low and high moor formations there occurred, not a pure pine forest, but a birch or birch-pine forest, in part also spruce, such as is found in the lower Lenatal in Siberia. This deviation points to a cooling of the climate during the last phases of the evolution, when the glacier advanced until in the "Ris" glacial period it finally covered the region. This interpretation is beautifully supported by the animal remains found, namely, in the lower horizons, forest fauna; in the upper, a fauna of thoroughly glacial character (*Cervus tarandus*, bison, rhinoceros, *Elephas primigenius*, etc.)—*Author* (*translated by F. V. Rand*).

9080. Sinnott, Edmund W. **Age and area and the history of species.** Amer. Jour. Bot. 11: 573-578. 1924.—The picture of the evolutionary history of a species, as presented by the Age and Area hypothesis, shows it as spreading slowly but steadily from its point of origin and gradually reaching the maximum range of which it is capable. Here it remains in its old age, a widely dispersed, ancient type which will ordinarily persist indefinitely. The evidence from paleobotanical and other sources that great numbers of species have disappeared, however, indicates that there must have been many exceptions to this course. The very common occurrence, in isolated regions, of genera which are not endemic there but have only endemic species, also indicates that the original species of the genus in this region must have disappeared, presumably through evolutionary change; and this (and other evidence) suggests that, in the normal history of a species, after it has become widely dispersed it tends, through the effect of isolation, to break up into a group of new species and thus to lose its identity. A widely dispersed species should thus be considered a relatively young one which has not had time to become broken up into new types. The conception of the history of species presented by the Age and Area hypothesis does not agree with that derived from the bulk of the evidence at hand.—*Author.*

9081. Thiessen, Reinhardt. **Origin of the boghead coals.** U. S. Geol. Survey Prof. Paper 132. *P. 121-135. Pl. 27-40.* 1925.—This paper rather definitely settles the organic nature of the material forming boghead coal, or kerosene shale, torbanite, albertite, brown cannel coal, bituminite and parrot coal, as it has been variously termed. Many opinions have been advanced in the past, the 2 most generally advocated being that the material was algal in nature or that it consisted largely of spore material. In this paper the author describes an existing colonial alga which he christens **Elaeophyton** *coorongiana*. This has oily nonputrifying cell walls and resembles so closely the structures found in boghead coal, and which Renault & Bertrand considered algae and referred to the 2 genera *Reinschia* and *Pila*, that there is slight room for doubt but that the living *Elaeophyton* is a similar organism to that which in the past was so largely instrumental in forming boghead coal.—*E. W. Berry.*

9082. [Thomas, H. H., and W. N. Edwards.] **Guide to the fossil plants in the Department of Geology and Palaeontology.** *72 p. 6 pl.* British Museum (Nat. Hist.): London, 1925.—This is a popular account of the fossil plant gallery in the British Museum, which discusses the arrangement of the exhibit, methods of fossilization, chronology, and principal divisions of the plant kingdom, and gives a brief illustrated account of the floras of the past by periods. The material exhibited and most of the discussion and figures are from British sources.—*E. W. Berry.*

9083. Wieland, G. R. **Dinosaur feed.** Science **61**: 601–603. 1925.—The author discusses some possible sources of the food of the herbivorous dinosaurs of the Mesozoic.—*E. W. Berry.*

9084. Wright, W. B., and W. H. Pearsall. **The ages of peat deposits.** Nature **115**: 336. 1925.—Two separate notes under one title, commenting upon the significance of local forest remains.—*O. A. Stevens.*

PATHOLOGY

Frederick V. Rand, *Editor*

Lillian C. Cash and Harry Braun, *Associate Editors*

(See also in this issue Entries 8206, 8231, 8232, 8250, 8256, 8257, 8282, 8286, 8299, 8301, 8309, 8316, 8325, 8327, 8328, 8329, 8419, 8434, 8437, 8453, 8510, 8519, 8528, 8529, 8532, 8538, 8545, 8558, 8559, 8570, 8576, 8606, 8607, 8612, 8634, 8647, 8649, 8653, 8657, 8659, 8677, 8678, 8705, 8735, 8750, 8775, 8786, 8787, 8793, 8811, 8813, 8825, 8827, 8856, 8858, 8859, 8869, 8881, 8892, 8894, 8910, 8912, 8918, 8947, 8998, 9000, 9009, 9012, 9015, 9019, 9025, 9034, 9037, 9039, 9040, 9041, 9052, 9062, 9065, 9066, 9366, 9368, 9393, 9413, 9536, 9549, 9566, 9568)

DISEASES CAUSED BY FUNGI

9085. Anonymous. **Dry treatment for the prevention of smut.** Jour. Dept. Agric. Western Australia 2nd Ser. **1**: 260. 1924.—A brief note on the application of the copper carbonate treatment.—*P. J. Olson.*

9086. Anonymous. **Fruit tree diseases, wood destroying fungi.** South African Fruit Grower **11**: 403. *Fig. 1–5.* 1924.—This is a short article on the wood destroying fungi such as *Schizophyllum commune*, etc. Lack of lime, which is characteristically deficient in the soils of the Western Cape Province of South Africa is a common predisposing cause of attack by these fungi.—*L. I. Goldblatt.*

9087. Baker, E. **The effect of formalin on the vitality of seed-wheat.** Jour. Dept. Agric. Union of South Africa **9**: 454–457. *1 fig.* 1924.—The values of the different methods of seed treatment are discussed. It has been found that a dilution of formalin of 1 pint to 50 gallons is efficient for the control of loose smut in oats, covered or stinking smut in wheat, and covered smut in oats and barley. Weekly germination tests for over a year were carried out on 6 varieties of wheat seed which had been held in a solution of 1 pint of formaldehyde in 50 gallons of water for 10 minutes. It appears that the treated seed keep better than the untreated and that seed wheat dipped in formalin and stored in the usual way does not suffer as regards germination to any great degree. If, as there is reason to believe, a dilution of 1 pint to 60 gallons is efficient there would appear to be less reason for changing the "dip" in favor of other fungicides which are more expensive and a possible source of danger to the farmer.—*L. I. Goldblatt.*

9088. Boyd, O. C. **Control measures for watermelon diseases.** Georgia State Bd. Entomol. Circ. 38. *1–4.* 1924.—The author recommends selection of a field that has not hitherto grown crops of melons, and warns against the use of stable manure infected with disease spores. He also suggests seed treatment with mercuric chloride 1–1000, and recommends spraying with Bordeaux mixture, using 3 normal applications, with an extra one if the weather is unusually rainy. The more serious diseases of watermelons may be controlled to a certain extent if careful harvest methods are followed. The main diseases referred to are anthracnose (*Colletotrichum lagenarium* (Pass.) Ellis & Hals.), wilt (*Neocomospora vasinfecta* (Atkinson) E. F. S.), and stem-end rot (*Diplodia* sp.).—*T. H. McHatton.*

9089. Brooks, Charles, and D. F. Fisher. **Prune and cherry brown rot investigations in the Pacific Northwest.** U. S. Dept. Agric. Bull. 1252. *1–21. Pl. 1–5, fig. 1–14.* 1924.—During the 5 years covered by the experiments there was never a serious epidemic of brown rot in the orchards. Various standard spray materials gave satisfactory orchard control and resulted in a decided reduction in the amount of brown rot that developed in transit. An application 3–5 weeks before picking time was found particularly valuable. Lime sulphur frequently caused severe injury on prunes. Both Bordeaux and self-boiled lime-sulphur resulted in smaller sized sweet cherries. Apothecia were abundant in the prune orchards and were also found on Black Republican cherries.—*Charles Brooks.*

9090. Brooks, Charles, and D. F. Fisher. **Spraying for brown rot control in the Northwest.** Amer. Fruit Grower **45**^{6}: 10, 25, 34. *Illus.* 1925.—This is a detailed discussion of the value of spraying to control brown rot in the Pacific Northwest, which is said to be one of the most serious problems in the successful growing and marketing of stone fruits in this section of the U. S. A. (see also preceding Entry). Since properly sprayed fruit has greater possibilities in the length of time which it can be held and in the points to which it can be distributed, the facts presented should be recognized in the plans for marketing and in the price which is paid for the fruit.—*Arthur S. Rhoads.*

9091. Caldis, Panos D. **A rot of the Smyrna fig in California.** Science **62**: 161–162. 1925.—The rot progresses from the cavity of the fruit outwards and produces a pulpy disintegration of the tissues. The mycelium is septate, hyaline and branching and produces abundant unicellular conidia. A tentative identification places it as *Oospora verticillioides* Sacc. *Bacterium prodigiosus* accompanies this fungus which is found only in caprified figs that remain sterile until visited by the insects. In the case of the Calimyrna fig and the insect *Blastophaga psenes* L. (*B. grossorum* Grav.), it has been proved that the spores are carried on the wings and vegetate on the pistil of the flower or on the dead body of the insect until an infection of the fruit can be effected.—*C. J. Lyon.*

9092. Carne, W. M. **Downy mildew (Sclerospora macrospora). An unusual disease of wheat.** Jour. Dept. Agric. Western Australia 2nd Ser. **1**: 315–316. *1 fig.* 1924.—A brief note pointing out that it is the first published record of the appearance of this disease in Western Australia. It is stated that this trouble is unlikely to be serious in the state except in very wet soils. A description is given which is credited to W. H. Weston, U. S. A. Dept. Agric. Dept. Circ. 186.—*P. J. Olson.*

9093. Carne, W. M. **Some diseases of apples.** Jour. Dept. Agric. Western Australia 2nd Ser. **1**: 322–325. *2 fig.* 1924.—Two abnormalities, namely, russeting and cracking of Dunn's apples, and blister canker or twig dieback, are described. Both of these are associated with the fungus, *Coniothecium* sp., and while it has not been definitely established that this fungus is the cause of these troubles, it is stated that the evidence points that way. Another "branch canker" which is associated with *Diplodia* is mentioned briefly. Suggestions for treatment are offered.—*P. J. Olson.*

9094. Cereal Rust Conference, 2nd., 1924. **Proceedings of the second Cereal Rust Conference held under the joint auspices of the Federal Department of Agriculture and the Research Council of Canada.** *148 p.* [Mimeographed.] 1924.—Addresses by various experts on the cereal rust problem are grouped under the following headings: the rust situation in the Dominion of Canada and the U. S. A.; investigations under way and review of results; and consideration of future research work on the rust problem.—*Lillian C. Cash.*

9095. Clark, E. S. **Seed potato disinfection studies.** New Jersey Agric. Exp. Sta. Ann. Rept. **44**: 410–414. 1923 [1924].—Comparative tests with hot and cold formaldehyde and corrosive sublimate are reported, indicating the latter to be much more effective in the control of *Rhizoctonia* of potatoes. Semesan, 1–50, greatly reduced germination of the sclerotia. Kalimat gave very poor control.—*Wm. H. Martin.*

9096. Colby, A. S. **Principles and practices in small fruit culture. Control of leaf spots on gooseberries.** Amer. Fruit Grower **45**^{7}: 24. 1925.—The Mycosphaerella leaf spot and anthracnose, which are said to be the 2 most destructive leaf spots of gooseberries, are discussed with regard to their appearance, economic importance and method of control.—*Arthur S. Rhoads.*

9097. Coleman, Leslie C., M. K. Venkata Rao, and M. J. Narasimhan. **Black rot or koleroga of coffee in Mysore.** Mysore Dept. Agric. Bull., Mycol. Ser. 5. *1–12 p. 4 pl., 1 fig.* 1923.—The authors discuss the descriptions and names given by M. C. Cooke and by Von Hohnel and agree with the latter in the nomenclature, *Corticium koleroga*, for the causal organism. They describe the symptoms in detail and have been able to find sclerotial masses in the mycelium, which previous authors had not noticed. Narasimhan has established not only that the sclerotia carry the fungus through the dry season but that fresh infection takes place from old leaves. The authors explain that the long time (1876 when Cooke published his paper up to the time of Von Hohnel's paper in 1910) taken to see the basidia and spores is due to the evanescent state of the basidiospores. The same fungus has been found to attack no less than 7 other species of plants and in the case of one of them, direct infection has been traced from the plant to a coffee bush. Pure cultures of the fungus were obtained from the material collected and successful inoculations were effected on coffee. Venkata Rao has shown that the mycelial web interferes seriously with the respiratory function of the leaves.—The various methods of combating the disease, such as pruning, removal of trash from the ground and spraying with Bordeaux mixture are discussed.—*P. S. Jivanna Rao.*

9098. Cooke, Melville T. **Enfermedades de la mancha de la hoja de la caña de azucar. [Leaf-spot diseases of sugar cane.]** Rev. Agric. Puerto Rico **14**: 185–187. 1925.—The author briefly describes cane diseases due to *Leptosphaeria sacchari*, *Helminthosporium sacchari*, *Cercospora vaginae*, *Sclerotium rolfsii*, *Cercospora longipes* and *Colletotrichum falcatum*.—*John A. Stevenson.*

9099. Cook, Melville T. **Enfermedades de la raiz de la caña de azucar. [Sugar cane root diseases.]** Rev. Agric. Puerto Rico **14**: 245–246. 1925.—The article contains a brief summary of sugar cane root disease and the several fungi found in connection with it.—*John A. Stevenson.*

9100. Costantin, J. **Les Rhizoctones. [Rhizoctonia.]** Ann. Sci. Nat. Bot. 10e Sér. **6**: i–xv. *Fig. 1–2.* 1924.—A resume of recent pathological literature on the genus *Rhizoctonia*, with bibliography of 63 titles.—*Paul Weatherwax.*

9101. Cottrell Dormer, W. **Pests and diseases of sugar cane.** Australian Sugar Jour. **17**: 82, 85, 86. 1925.—Because of excessive humidity the Johnstone River districts of Australia are a wonderland of lower botanic forms. Some of these forms are parasitic on the cane plant, but the majority are saprophytic on the refuse of cane fields. Prominent among the latter are 2 species of stinkhorn fungi, one white and one orange yellow, which are described. In the soil below these plants a quantity of thin pink strands of fungus roots are found. These interweave with the roots of the cane, but between them no intimate connection is seen.—The sclerotial disease of the leaf sheath causes clinging trash and spindly sticks, and is due to a fungus which thrives under very moist conditions. Its occurrence is very much extended by indiscriminate use of pink sticks where the Badila variety of cane is concerned.—A rather serious leaf disease occurring in small patches consists of large dead spots of 1–2 square inches surrounded by a dull red, irregular border. These spots are found on the leaves and leaf sheaths of affected stools and often coalesce and form large dead strips. In damp weather there is a light, fluffy growth of the fungus and small oval conglomerations of fungous mycelium on the under side of the leaf. The disease is probably virulent.—*Nellie E. Fealy.*

9102. Coulson, J. G., and E. A. Lods. **Oat smut infection in relation to the size of grain.** (Abstract.) Phytopathology **15**: 302–303. 1925.

9103. Crepin, Ch. **Observations sur les rouilles des céréales en 1924 à Grignon. [Cereal rusts near Paris in 1924.]** Rev. Path. Vég. et Entomol. Agric. **11**: 317–320. 1924.—The resistance or susceptibility of a given variety of cereals to *Puccinia graminis*, *P. glumarum*, or *P. triticina* depends on climatic conditions; hypersusceptible spots could be observed even on susceptible wheats during the summer of 1924.—*J. Dufrenoy.*

9104. Davis, W. H. **Drop of Chinese cabbage and our common cabbage caused by Sclerotinia sclerotiorum (Lib.) Massee (Sclerotinia libertiana Fckl.).** Phytopathology **15**: 249–259. *Pl. 3–4, fig. 1–3.* 1925.—During the late summer and fall of 1923 and again in 1924 a "drop" disease, with symptoms resembling those produced on various host plants by *Sclerotinia* *sclerotiorum* (Lib.) Massee, caused severe damage in the variety plats of Chinese cabbage (*Brassica Pe-Tsai* Bailey) at the Massachusetts Agricultural College. The fungus from Chinese cabbage was compared with the above named species and found to be apparently identical with it.—*B. B. Higgins.*

9105. Dawson, W. J. **A new disease of sweet peas.** Jour. Roy. Hort. Soc. **49:** 211–221. *Fig. 47–51.* 1924.—The occurrence of a new disease of sweet peas under glass is recorded. The fungus concerned has also been found on sweet peas grown out of doors. A mildew-like appearance is produced on the leaves and wings of the stems. The fungus was isolated and grown in pure culture and its parasitic nature was proved by repeated infection experiments on sweet pea plants under glass.—No infection was obtained on *Pisum sativum* or on *Lathyrus Aphaca.* High temperature and a moist atmosphere are the important factors concerned in the spread of the disease, particularly under glass. Protection from infection can be obtained by dusting the plants with sulphur in a fine state of division. The fungus was studied carefully in the laboratory, and reasons are given for considering it to be *Cladosporium* rather than *Ramularia.* The name *Cladosporium album* n. sp. is proposed.—*J. K. Shaw.*

9106. Dean, Daniel. **High pressure spray machinery.** Proc. 11th Ann. Meeting Potato Assoc. America **1924:** 84–86. 1925.—Attention is called to the heavy losses to the 1924 crop in some sections, from late blight tuber rot. A 20 years' personal experience with potato spraying leads the author to state that late blight can be controlled only by frequent and thorough spraying of the plants throughout the growing season. The successful control of late blight infection is believed to be dependent on several factors such as care in making Bordeaux mixture, high pressure, care in application to see that all parts of the plants are covered, and frequent sprayings continued until the vines are practically dead. The spray outfit now being used by the author has a 6-horse power motor sprayer with a capacity of 15–18 gallons per minute at a pressure of 290 pounds per square inch.—*W. Stuart.*

9107. Dickson, B. T. **Oat smut control tests at Macdonald College during 1924.** (Abstract.) Phytopathology **15:** 301. 1925.

9108. Dietz, S. M. **The rôle of the genus Rhamnus in the dissemination of crown rust.** U. S. Dept. Agric. Bull. 1162. *1–18. Fig. 1–8.* 1923.—*Rhamnus cathartica* L., which commonly bears aecidia of *Puccinia coronata* Corda, was the cause of severe epidemics of crown rust in Iowa, Illinois, Minnesota and Wisconsin. Such an epidemic at Hinton, Iowa, caused the total loss of oats in the fields adjoining the hedge. Topography, wind and other climatic conditions during the time the aecidiospores are forming probably are the most important factors in the spread of crown rust. Wild and cultivated grasses growing near the infected hedge had little influence on the spread of rust. Aecidiospores from *R. cathartica* caused infection on oats to a distance of 452 rods. The subsequent spread by uredospores from this primary aecidiospore infection was traced for a maximum distance of 53 miles. *R. lanceolata* is also responsible for the spread of crown rust to oats. *R. caroliniana, R. alnifolia, R. frangula, R. smithii, R. purshiana, R. californica* and *R. crocea* are relatively unimportant in the dissemination of crown rust to oats.—*Author.*

9109. Dimock, Julian A. **Potato dusting vs. spraying in Vermont.** Proc. 11th Ann. Meeting Potato Assoc. America **1924:** 74–76. 1925.—It is admitted that until the year 1924 full confidence was placed by the author in the efficacy of dusts for control of late blight. At present he is about ready to admit that there may be conditions under which dusting will not control late blight. A 7 years' experience with dust has given 5 out of 7 crops free from decayed tubers. In the season of 1924 a considerable amount of late blight tuber rot occurred in the storage house due to late infection in the field as a result of heavy rains interrupting dusting operations between September 7 and 15, when it is suspected that the plants became infected with late blight. The author believes that wherever the water supply is limited or difficult of access dust should replace the wet spray. It is claimed that a single hand duster will efficiently care for 3 acres. Where labor is high-priced dust is better as it saves time.—*W. Stuart.*

9110. Doran, W. L. **Experiments on the control of apple scab and black rot and spray injury in 1924.** Massachusetts Agric. Exp. Sta. Bull. 222. *1–10.* 1925.—Primary infection of leaves by scab (*Venturia inaequalis*) was prevented equally well by lime-sulphur solution, Bordeaux mixture, and dry-mix sulphur-lime. The addition of calcium caseinate spreader to lime-sulphur lead-arsenate spray did not result in increased protection against scab. Dry-mix sulphur-lime did not control scab as completely as did lime-sulphur. The disease was satisfactorily controlled by the use of sulphur dust. Lime-sulphur lead-arsenate spray caused foliage injury and this was not prevented by the addition of calcium caseinate spreader. Leaves on trees dusted with sulphur or sprayed with dry-mix sulphur-lime were not injured. The addition of calcium caseinate spreader to lime-sulphur lead-arsenate spray resulted in a reduction of about 50% in the number of russeted fruits on Gravensteins. Bordeaux mixture or copper dust for pre-blossom applications caused a larger percentage of russeted apples than did lime-sulphur or sulphur dust for all applications. Infection by black rot (*Physalospora Cydoniae*) was light but there was some indication of protection against this disease given by sulphur dust.—*Author.*

9111. Ducomet, V. **La rouille du Prunier.** [**Rust of Prunus.**] Rev. Path. Vég. et Entomol. Agric. **11:** 262–267. 1924.—Teleutospores of *Puccinia pruni-spinosae* Pers. were obtained on leaves of *Prunus spinosa* infected by spores of *Aecidium punctatum* from leaves of *Anemone coronaria.* Destruction of wild and cultivated anemones from the vicinity of plum orchards, and Bordeaux spraying at the time when aecidiospores are being liberated from rusted anemones, are advocated.—*J. Dufrenoy.*

9112. Fant, G. W. **Spraying tests for the control of apple blotch.** New Jersey Agric. Exp. Sta. Ann. Rept. **44:** 408–409. 1923 [1924].—The results of a spray test for the control of apple blotch (*Phyllosticta solitaria*) are reported. Blotch was first observed on June 26. Where the regular spray schedule, 7 applications in all, was followed, using commercial concentrated lime-sulphur, 1–40, only 7.6% of the fruit was clean. On blocks receiving 1, 2, and 3 additional applications on June 26, July 6 and July 14, the clean fruit was increased to 31.4, 51.1 and 53%, respectively.—*Wm. H. Martin.*

9113. Farrell, F. D. **Director's report 1922–1924.** Kansas Agric. Exp. Sta. Rept. **1922–1924:** 1–146. 1924.—Wheat foot rot occurred in the wheat tillage plots of the agronomy farm where it caused much damage. It has been found over several seasons' work that the plots receiving early and deep tillage are attacked the worst by foot rot. Shallow working of the soil in September, or merely keeping the weeds scraped off, greatly reduces the amount of foot rot. The soil moisture factor seems to be a very important one in connection with this disease as it occurs in Kansas. *Helminthosporium sativum* and *Ophiobolus cariceti* are associated with the problem in Kansas.—Extensive wheat leaf-rust investigations are being conducted. Resistance to leaf-rust in wheat is apparently a recessive character dependent upon a single main factor difference for its expression. Extensive wheat bunt varietal studies have been made. Both *Tilletia tritici* and *T. laevis* were used for artificial inoculation. Red Hussar and several other strains of wheat were found to be highly resistant to both species. The long time formaldehyde treatment (1–320) for barley gave excellent control of the barley smuts and did not affect germination of hulless or hulled barley. Treatment of ordinary hulled oat seed with copper carbonate is not satisfactory for smut control. Selections of Fulghum, Burt and Red Texas have been secured, which are very resistant to smut. Pure lines of Kanota and even commercial fields of Kanota oats are very resistant to smut.—Some sorghum hybrids (Feterita × Red Amber) in the F_7 generation are practically immune from infection by *Sphacelotheca sorghi*, the ordinary kernel smut. Extensive seed treatment experiments in which various dusts and liquids have been used show promise.—In the corn smut and root rot investigations, several inbred lines have been secured which show resistance to these diseases. Pride of Saline, Commercial White, Kansas Sunflower and Bloody Butcher are being used in the studies. The corn smut organism is being studied from physiologic and ecologic points of view. Among potato disease control studies, it has been found that the hot formaldehyde treatment is as effective as the $1\frac{1}{2}$ hour corrosive sublimate treatment. From 3 to 4 minutes at 124–126°F. is recommended rather than the lower temperatures generally used in other states. Bordeaux sprays do not produce an increased yield in the absence of foliage diseases. Tomato wilt experiments have been conducted for 6 years. A hybrid Kansas 9B (now named Kanora) is very promising from the standpoint of earliness, yield and resistance to wilt. Selections of Louisiana Red and Pink, Marvel, Norton and Norduke have been made and have a place in the home garden. Selections of Wisconsin All Seasons and Brunswick and Kansas Copenhagen cabbage show resistance to yellows.—*L. E. Melchers.*

9114. Fenner, E. Aline. **A rot of apples caused by Botryosphaeria ribis.** Phytopathology 15: 230–234. 1925.—Isolations were made from apples, affected with what appeared to be black rot (*Sphaeropsis malorum* Peck), collected from widely separated regions of the U. S. A. and Canada. About 10% of these decaying apples yielded *Botriosphaeria ribis* and its form, *B. ribis chromogena*, the currant cane-blight organism. The identity of the apple fungus with that from the currant was shown by cross inoculations, the production of typical currant cane blight by inoculating with the fungus from decaying apples and the production of the apple rot by inoculating with the fungus from blighted currant canes, and by the similarity in morphological characters. *Botriosphaeria mali* Putterill, recently described from apples in South Africa, and *Dothiorella mali* Birmingham in New South Wales appear to be identical with *Botriosphaeria ribis*.—*B. B. Higgins.*

9115. Folsom, Donald, and Reiner Bonde. **Alternaria solani as a cause of tuber rot in potatoes.** Phytopathology 15: 282–286. *Pl. 5–7.* 1925.—A hitherto unreported spotting of Irish potato tubers has been found in Maine and in Florida on potatoes grown from Maine seed. The spots were small, usually less than 1 cm. in diameter, circular or irregular in outline, slightly sunken, usually darker than the healthy tissue, and always shallow. Isolations from these spots gave cultures of *Alternaria solani*. Successful inoculations were made by rubbing immature tubers with mycelium of this fungus and by spraying with a spore suspension. The lesions produced were similar to those originally found and gave pure cultures of the Alternaria. Similar lesions also developed when immature tubers and blighted leaves were packed together. Inoculations on leaves produced spots similar to early blight spots. These results suggest that tuber infection may occur when immature tubers come in contact with blighted leaves at digging time.—*B. B. Higgins.*

9116. Frey, C. N., and G. W. Keitt. **Studies of spore dissemination of Venturia inaequalis (Cke.) Wint. in relation to seasonal development of apple scab.** Jour. Agric. Res. 30: 527–540. *Fig. 1.* 1925.—The content of spores of *Venturia inaequalis* in orchard air was studied by means of specially devised apparatus. In 1917, the 1st natural discharge of ascospores was recorded on May 19, and the last on July 18. The initial discharge was unusually delayed because of drought. Ascospores were discharged during rains throughout the period indicated. The very heavy discharges, however, were limited to the period of May 19 to June 7. The maximal concentration was observed on May 21, when the average rate of catch for 8½ hours was 1 ascospore to 0.4 liter of air. The presence of an adequate amount of water was the most important requisite for the discharge of mature ascospores. Wetting by dew did not induce discharges of consequence. When abundant mature ascospores were available, heavy discharge started soon after rain began and continued as long as the leaves were thoroughly wet and the supply of ripe asci lasted. Conidia of *Venturia inaequalis* were found in the air only during rainy periods, and particularly when rain was accompanied by strong wind. They are resistant to detachment from conidiophores when dry, but are readily detached when wet. Their chief mode of dissemination is by meteoric water. The seasonal development of the host plant and the disease were followed in relation to studies of spore production, dissemination, germination and infection.—*G. W. Keitt.*

9117. Fulton, Harry R. **Relative susceptibility of citrus varieties to attack by Gloeosporium limetticolum (Clausen).** Jour. Agric. Res. 30: 629–635. 1925.—Inoculation tests on a wide range of citrus species and varieties show that definite susceptibility to the withertip disease (*Gloeosporium limetticolum* Clausen) of limes is apparently restricted to the common West Indian lime and the Dominican Thornless lime, a derivative of the former. Immune varieties of limes may prove to be satisfactory substitutes for the highly susceptibility ones, or may furnish the materials for breeding work to originate new resistant types.—*Author.*

9118. Gram, Ernst. **Forsog med Bekaempelse af Kartoffelskimmel paa Kartofler og tomater. 1917–1923. [Experiments on the control of late blight of potatoes and tomatoes.]** (With English summary.) Tidsskr. Planteavl. 30: 597–621. 1924.—An average increase of about 13%, and larger and healthier tubers have been secured through spraying potatoes during the course of over 1,000 field experiments. Best results have been secured with 2% 8–8–50 Bordeaux mixture applied twice at the rate of 280–400 kg. per acre, the 1st application made as soon as late blight (*Phytophthora infestans*) was noted. Home-made Bordeaux was found to be superior to Burgundy mixture and a number of proprietary fungicides. Uspulun, lime-sulphur and Solonia were ineffective against late blight. Bordeaux dust, although convenient, was less resistant to rains and not as effective as Bordeaux spray.—Excellent results with tomatoes grown in the open were secured during a 4-year period by spraying twice each year with 2% Bordeaux. Proprietary fungicides and lime-sulphur were found to be generally ineffective. Spraying with Bordeaux increased yields and reduced late blight on the fruits to the point of doing little or no damage, although it did not protect the stems from attack by *Ascochyta lycopersici*, a serious tomato disease in Denmark.—*Albert A. Hansen.*

9119. Guba, Emil Frederick. **Phyllosticta leaf spot, fruit blotch, and canker of the apple: its etiology and control.** Illinois Agric. Exp. Sta. Bull. 256. *481–557. Pl. 1–4, fig. 1–18.* 1925.

9120. Guyot, L. **Observations sur diverses maladies des céréales.** [Some diseases of cereals.] Rev. Path. Vég. et Entomol. Agric. **11**: 268–287. 1924.—Partial abortion of flowers on wheat spikes was observed in fields near Moulins, following infection by *Erysiphe graminis*. —Infection of wheat by *Fusarium culmorum* proved more severe where drought was excessive. —The "piétin" (take-all) caused by *Ophiobolus graminis* was most common in the valleys of the Velay region, but has never been observed higher up than 1000 m. above sea, even where cultural conditions might be expected to favor infection. Climatic conditions are claimed to control the distribution of the disease; different wheat varieties are variously affected in the different regions.—*J. Dufrenoy.*

9121. Haenseler, C. M. **Pea root rot investigations.** New Jersey Agric. Exp. Sta. Ann. Rept. **44**: 366–375. *1 pl., 3 fig.* 1923 [1924].—While generally distributed throughout the state, pea root rot is most severe on sandy soils and in Burlington, Camden and parts of Cumberland counties. In 1922, 40 varieties of peas were tested for varietal susceptibility. None of them proved to be appreciably resistant but several varieties, notably, Sutton's Ideal and Worlds Record, gave good yields despite the fact that the roots were severely rotted. The Alaska, Thomas Laxton, Peter Pan, and Pilot proved to be very susceptible. Using small amounts of infected soil as inoculum, it was demonstrated that the organisms causing pea root rot are soil carried.—Isolations made from more than 100 typical roots gave several species of *Fusarium*, *Rhizoctonia solani*, *Phoma* sp. and a sterile fungus. From diseased greenhouse material several species of green Trichodermas and a Zygorhyncus were repeatedly found. Inoculation studies were successful with *Rhizoctonia*, the sterile fungus and one of the Fusaria.—In studies of the influence of soil moisture on development of root rot, it was found that *Rhizoctonia* was much more injurious in very dry than in very wet soil. In a 2nd test this organism developed in all cultures, regardless of the moisture content, but it was apparently less parasitic at a moisture content most favorable to the host.—In an experiment to determine the influence of the age of plant on susceptibility to *Rhizoctonia*, it was found that the germinating pea was most susceptible; after the plants are above ground their susceptibility apparently does not change with age.—*Wm. H. Martin.*

9122. Haenseler, C. M. **Peach wilt.** New Jersey Agric. Exp. Sta. Ann. Rept. **44**: 364–366. *2 pl.* 1923 [1924].—This trouble was found in 3 orchards, but only on rapidly growing trees 2–4 years old. The first indication of wilt is a sudden dying of one or more of the branches on one side of the tree. Preliminary to the dying of these branches there is generally a check in active growth and a partial wilting of the leaves with progressive shedding of the leaves towards the tip. The youngest leaves frequently remain attached until the twig wood is well shriveled, but these finally fall, leaving the dead twigs bare. Most of the diseased limbs and twigs show a very conspicuous darkening of the wood, sometimes involving all the woody portion, sometimes only a band around an apparently normal center. Isolations made from 37 twigs yielded a Verticillium from 30. Cultural studies of the organism indicate it to be *V. albo-atrum*. Inoculation studies on the egg plant were successful, but it was impossible to secure infection on the peach. It is suggested that winter injury is probably the predisposing factor.—*Wm. H. Martin.*

9123. Harrington, J. B. **The inheritance of resistance to Puccinia graminis in crosses between varieties of durum wheat.** Sci. Agric. **5**: 265–288. *Illus.* 1925. (For abstract see this issue, Entry 8752.)

9124. Hendrickson, A. H. **Oak fungus in orchard trees.** California Agric. Exp. Sta. Circ. 289. *1–13.* 1925.—All rootstocks used for stone fruits are more or less susceptible to attack by *Armillaria mellea.* Apples are considered highly resistant, especially on Delicious stock, and French pear root is practically immune. Fig and California black walnut are very resistant. A concrete barrier enclosing the diseased spot usually checks the progress of the fungus. When the diseased area is extensive, it should be replanted with resistant species. The graft union of resistant roots should not be covered with soil because a susceptible scion may be attacked by the disease even though the root was not affected.—*A. R. C. Haas.*

9125. Hubert, Ernest E. **Effect of kiln drying, steaming, and air seasoning on certain fungi in wood.** U. S. Dept. Agric. Dept. Bull. 1262. *1-20. Pl. 1-5, fig. 1-2.* 1924.—The tests carried out by the author show that a long list of wood-inhabiting fungi, including *Ceratostomella* species and other sap stain fungi, as well as some of the more common wood rot fungi (*Trametes pini, Trametes carnea, Fomes pinicola, Fomes fomentarius, Fomes igniarius, Fomes laricis, Polyporus anceps, Polyporus schweinitzii, Polyporus amarus, Polyporus borealis, Polystictus hirsutus, Polystictus abietinus, Lenzites sepiaria, Ganoderma tsugae, Pholiota adiposa*) in a variety of woods can be effectively arrested in their development through sterilization by heat. Of the various fungi tested, the blue-stain fungi appear to be the most resistant to heat. No great differences in resistance were noted among the various rot-producing fungi tested. Commercial kiln conditions and steaming processes coming within the effective limits of temperature and time as determined by the tests are effective in sterilizing infected wood up to and including pieces 4 inches in thickness. For the same temperature, thicker pieces required a longer period of heating. Methods of piling and storing lumber were found to be important factors in protecting wood against fungous infection. Certain fungi continue to develop in wood as long as favorable conditions are present, and they will revive and continue development after long periods of drying. From the data obtained it is assumed that wood that is properly kiln dried will be sterilized and that with proper storage it will remain bright and sound.—*Author.*

9126. Hubert, Ernest E. **Heat treatment of infected wood.** Timberman 26^7: 52, 54. *1 fig.* 1925.—Results are given of sterilizing hardwood and softwood samples of varying sizes infected with stain and rot fungi by treatment with heat at varying temperatures and humidity percentages, and with steam at various temperatures and pressures.—*Duncan Dunning.*

9127. Khan, A. Hafiz. **The artificial development of sporophores of Polyporus Gilvus.** Indian Forest. 51: 205-207. *1 pl.* 1925.—Using decaying wood of *Dalbergia Sissoo*, it was possible to develop cultures of the root fungus which has caused much damage, the development of which had so far escaped detection.—*E. N. Munns.*

9128. Ludwig, C. A. **Studies with anthracnose infection in cotton seed.** South Carolina Agric. Exp. Sta. Bull. 222. *1-52. Frontispiece, 13 fig.* 1925.—Anthracnose (*Colletotrichum Gossypii*) is one of the most important of the pests of cotton and is known to occur in most of the cotton growing regions of the world. It is transmitted from season to season very largely by infected seed; and considerable work, which is reviewed, has been done in an attempt to perfect a quick, practical method of destroying the fungus in the seed. Although such a method has not hitherto been found, effective measures for control have been devised. These consist of such sanitary measures as selection of seed from healthy stalks not growing near diseased ones, plowing under of diseased cotton stalks in the fall or following a rotation, ginning in a clean gin, delinting with strong H_2SO_4, and storing infected seed for at least 2 years before planting in order to allow the fungus to die.—The experimental work reported was a study of some of the environmental features which affect the life of the fungus in stored infected seed. The seed of a heavily infected sample were divided into portions, given various treatments, stored in various ways, and tested at intervals for the presence of the fungus. The tests were made by germinating the seed in test tubes under aseptic conditions and examining the resulting seedlings for anthracnose lesions. The results show that cotton seed infected with the anthracnose fungus become free of the infection in storage. Under laboratory conditions the action proceeds very slowly at first but becomes rapid when the seed are about a year old. By the 2nd spring after picking, the infection has practically disappeared. None of the ordinary methods of heating, drying, or storage had much effect on the infection. Storage in a very moist atmosphere led to the early death of the fungus but the seed became musty and failed to germinate. On the other hand storage in a very dry atmosphere prolonged the life of the fungus greatly. Storage in alternating very dry and very moist air seemed at first to accelerate the death of the fungus but the date of complete freedom from infection came little or no sooner than in the check. Sunning the seed seemed to accelerate the death of the fungus somewhat but the results were so slow as to be of no practical value. Delinted and sterilized seed have the initial infection cut down to a low figure, and that remaining in the seed seems to become eliminated a few months sooner than in untreated seed.—*Author.*

9129. Ludwigs, Karl. **Die Bekämpfung der Kohlhernie (Plasmodiophora brassicae). [The control of club root.]** Mitteil. Deutsch. Landw. Ges. **40**: 314–316. 1925.—Club root has of late been on the increase in Germany. This is thought to be due in part to a decreased use of lime. The author gives a summary of the work on club root and discusses the use of certain control measures. Success has been had in some cases by the use of Uspulun, especially when it was mixed with the soil in the proportions of 1 liter of soil with 0.25 or 0.5 gm. of Uspulun and frequently watered before the seed was sown. The author has had good results from mixing 1 cu. m. of earth with 250 gm. of Uspulun, but when the soil was watered with a 0.25% solution of Uspulun, such good results were not secured. A stronger concentration also gave no results, because the Uspulin was absorbed in the upper layers of the soil and did not go down among the roots where infection from the swarm spores took place. A 0.25% solution of Uspulun was poured into the holes made in the soil near plants, and this gave fairly satisfactory results. Uspulun does not kill the spores, but merely accomplishes the same purpose as lime, inhibiting their germination. Even when a 3% solution of Uspulun was used, the spores were killed only in the upper layers; at a depth of 4–5 cm. they remained alive. Further advice is given in regard to combating club root, the use of lime and of Uspulun being mentioned.—*A. J. Pieters.*

9130. Lutz, L. **Sur la spécificité de quelques Hyménomycétes lignicoles vis-a-vis de leurs supports. [The specificity of certain wood-inhabiting Hymenomycetes for their source of food.]** Compt. Rend. Acad. Sci. Paris **180**: 759–760. 1925.—It is concluded that the specificity of wood-inhabiting fungi is conditioned not on the presence or absence of the proper nutrient substance, but on the presence or absence of an inhibiting substance which may be eliminated by water or some other solvent.—*C. H. Farr.*

9131. McCallum, A. W. **A study of decay in balsam fir.** (Abstract.) Phytopathology **15**: 302. 1925.

9132. McDonald, A. H. E. **Germination tests with "shot" wheat. Effect of treatment for bunt.** Agric. Gaz. New South Wales **36**: 414–416. 1925.—The results of different treatments for bunt are given for wheat bleached and germinated in the shock. It was found that injured wheat when treated by bluestone solution has its viability reduced to such an extent that there may be an almost total failure of germination. Copper carbonate seemed also to affect germination but much less so than the bluestone.—*L. R. Waldron.*

9133. MacInnes, Jean. **Quantitative studies on the efficiency of fungicides.** Phytopathology **15**: 203–213. *Fig. 1–9.* 1925.—A method is described by means of which it is possible to measure the changes in electrical resistance of fungi during the time they are being killed by fungicides, with the idea of obtaining a rapid and reliable quantitative measure for the relative efficiency of such agents. The fungus employed in these experiments were *Aspergillus niger.* The results obtained showed clearly that death comes about in a very different manner when $HgCl_2$, $CuSO_4$, and formaldehyde are used as killing agents. They indicate definitely, however, that changes in electrical resistance may be taken as a measure of toxicity, for, with equal molecular concentrations of the various substances, the rate of change was much the most rapid with mercuric chloride, and the rate with copper sulphate more rapid than with formaldehyde. This conclusion was further substantiated by the fact that an increase in concentration of any of the substances increased the speed with which the resistance changed. Experiments on growth of the fungus after treatment in these solutions gave results in the same relative order both for the substances used and for the effect of concentration.—*Author.*

9134. Maunoury, G. **Notes sur le Piétin des céréales. [Take-all disease of cereals.** Rev. Path. Vég. et Entomol. Agric. **11**: 299–303. 1924.

9135. Melchers, L. E., and H. B. Walker. **The copper carbonate dust method of controlling bunt of wheat.** Kansas Agric. Exp. Sta. Circ. 107. *1–14. 5 fig.* 1924.—The copper carbonate dust method is described and recommended for the control of bunt of wheat, but is not advised for any of the other cereal smuts. Experiments under way show that it is proving of great value for the control of sorghum kernel smut. Seed wheat and sorghum seed treated with this dust give much better stands, due probably to the elimination of organisms which cause decay of the seed. Directions are given for the construction of various outfits used in this treatment.—*L. E. Melchers.*

9136. Mix, A. J. **Anthracnose of European privet.** Phytopathology **15**: 261–272. *Fig. 1–3.* 1925.—During the past 5 years anthracnose (*Glomerella cingulata*) has been very destructive to hedges of European privet (*Ligustrum vulgare*) in Kansas. In addition to the twig blight and cankers previously noted, girdling cankers were often produced at the base of the stem, killing the entire plant. Wound inoculations were successful on the twigs of *Ligustrum vulgare;* but they were not successful on *L. amurense, L. ibota, L. ibota regelianum,* or *L. ovalifolium.* Neither has the disease been found occurring naturally on any of the latter species, and it is suggested that they be substituted for the European privet as a hedge plant where anthracnose is prevalent.—*B. B. Higgins.*

9137. Mix, A. J. **Biological and cultural studies of Exoascus mirabilis.** Phytopathology **15**: 214–222. *Fig. 1–2.* 1925.—This fungus was isolated from ascospore material and from the interior of diseased twigs of *Prunus angustifolia.* In culture the morphological characters and physiological reactions were similar to those of *Exoascus deformans* (Bot. Abst. **13**, Entry 7278). The disease appears to be easily controlled by spraying during the dormant period, indicating that spring infection is due to spores on the surface of the twigs rather than to hibernating mycelium inside the twigs. This conclusion is further supported by other observations on infection and on the development of the disease. All attempts at artificial inoculation have failed.—*B. B. Higgins.*

9138. Mix, A. J. **The weather and peach leaf curl in eastern Kansas in 1924.** Phytopathology **15**: 244–245. 1925.—Observations indicate that over-wintering spores of *Exoascus deformans* may produce infection at the time the buds open and also after the leaves are considerably expanded. In these older leaves the infection is localized and the leaf does not become so distorted as in the case of bud infection.—*B. B. Higgins.*

9139. Moir, W. Stuart. **White-pine blister rust in western Europe.** U. S. Dept. Agric. Dept. Bull. 1186. *1–32. Pl. 1–4, fig. 1–15.* 1924.—This bulletin details the writer's study of the blister-rust situation in several European countries during 1919 and 1920 and gives an historical review of the disease, which was first discovered some 65 years ago in the Baltic Provinces of Russia. The author discusses the susceptibility of blister-rust hosts (5-needle pines, currants and gooseberries); the relation of white pines to European forestry; the importance of currants and gooseberries; damage to eastern white pine in Europe, Sweden, Norway, Denmark, the British Isles, France, and Belgium; control measures recommended in Europe and the significance of European experience to America; economic aspects of the problem; and a summary of the blister-rust situation in Europe, including European experience as a warning to America.—Due to this disease, white pine will be found less and less in Europe; the average European prizes Ribes fruit, so carefully grown for centuries, above the white pine. Observations abroad indicate that sugar pine, western white pine and limber pine are as readily attacked and as severely damaged as eastern white pine. European climatic conditions suitable for growing of the 5-needle pines are found to be favorable also to blister-rust. Control of the malady as a forest tree disease apparently has not been seriously attempted in Europe. In the U. S. A., blister-rust is spreading into western white-pine, and sugar-pine forests. Cooperative experiments between U. S. Dept. of Agric. and several states have demonstrated that under average forest conditions in the northeastern U. S. A., white pine can be effectively protected by uprooting all wild and cultivated currant and gooseberry plants within a distance of 600–900 feet of the trees.—*Frederick V. Rand.*

9140. Moore, W. D. **Corn root and ear rot studies.** New Jersey Agric. Exp. Sta. Ann. Rept. 44: 404–407. 1923 [1924].—While *Fusarium culmorum* was found in some samples of corn, *Glomerella saubinettii, Fusarium moniliforme* and *Cephalosporium* sp. were most commonly found. Seed corn grown in the heavier soils of northern New Jersey showed a lower percentage of infection than that grown in the light soils of southern New Jersey. Inoculation studies on seedlings and growing ears proved successful with all 4 organisms. In a test to compare diseased and disease-free seed, 90.1% of the latter and 77.7% of the former germinated. At harvest time 49.6% of the ears from the disease-free seed were diseased and 77.7% from the diseased seed. Corn root-rot was found to be most severe on soils with high hydrogen-ion exponent values.—*Wm. H. Martin.*

9141. Murray, J. C. **[Report of the field assistant of the southern division, Bureau of Sugar Experiment Stations.]** Australian Sugar Jour. **17**: 87, 93. 1925.—In the partially sterile pockets that occur in the red soils of the Bundaberg district the cane is generally weak and is attacked by foot-rot or root-rot disease which appears to be caused by *Marasmius sacchari*, the Marasmius mycelium covering the base of the shoots in nearly all cases. In order to prevent the disease from spreading, these soils should be strengthened so as to produce cane having greater resistance.—*Nellie E. Fealy.*

9142. Pennington, L. H. **Relation of weather conditions to the spread of white pine blister rust in the Pacific Northwest.** Jour. Agric. Res. **30**: 593–607. *Fig. 1–2.* 1925.—White pine blister rust was introduced into Vancouver, British Columbia, in 1910 upon *Pinus strobus*. Since that time it has been found upon *Pinus monticola* in many places extending over 100 miles north of Vancouver and 60 miles south and east along the Fraser Valley. It has also been found at Beaton, Canoe, Nakusp, and Revelstoke, in the eastern part of British Columbia. These places are 30–60 miles apart and at distances of 150–200 miles east of white pine in the coast belt. The rust has been found upon *Ribes nigrum* over a distance of 200 miles south of Vancouver, as far as the Columbia River; northwest of Vancouver at a distance of 110 miles north of the northern limit of white pine; and at many places east of the Cascade Mountains. Some of these were fully 80 miles from any white pines. Evidence is given to show that this wide distribution of the rust has been caused by wind-borne aeciospores which, under favorable moisture conditions, caused infection, usually upon *Ribes nigrum*. Tabulations and studies of pine infections indicate that widespread and severe infection has occurred in British Columbia approximately every 4 years since the introduction of the rust. Tables show the average summer precipitation as well as variations of precipitation in different years, both for places where infection has occurred and for other places in the white pine and sugar pine areas of the West. Tables also show variations in the amount and direction of wind during the season of aeciospore dispersal at different places in the pine regions of the West. Wind and moisture conditions during the summer months seem to cause the rust to spread southward more slowly than in other directions.—*Author.*

9143. Phillips, Edith H., Elizabeth H. Smith, and Ralph E. Smith. **Fig smut.** California Agric. Exp. Sta. Bull. 387. *1–38.* 1925.—Fig smut is caused by *Aspergillus niger* and is not a special strain of *A. niger*. The figs become infected when they are still on the tree, at the time when the eye opens and the fruit begins to soften. The fungus is usually carried into figs by insects of which the dried fruit beetle (*Carpophilus hemipterus*) is most important. The vinegar fly (*Drosophila ampelophaga*) is probably 2nd in importance. Spraying with insecticides or fungicides and soil fertilization at no time had an appreciable effect in controlling smut or any other of the fig troubles. Destruction of the dried fruit beetle and insects of similar habits seems very promising for the control of smut. This can be largely accomplished by good orchard sanitation to destroy the breeding places of such insects. The Black Mission and Kadota varieties are much less affected by smut, souring, and similar troubles than the Calimyrna and Adriatic. This immunity of the Mission and Kadota varieties seems to be due to exclusion of insects from the inside of these figs by their solid structure and closed eye, rather than to any real resistance.—*A. R. C. Haas.*

9144. Poole, R. F. **Some results obtained in the investigation of the control of the scurf disease of sweet potatoes.** New Jersey Agric. Exp. Sta. Ann. Rept. **44**: 387–393. 1923 [1924]. —In continuation of previous experiments, a report is given on the use of sulphur for the control of sweet potato scurf (*Moniliochaetes infuscans*). With the different quantities of sulphur used, all gave an increase in the number of clean roots but in no instance was scurf entirely eliminated. In some instances an increased yield followed the application of sulphur.

In tests to compare the relative value of inoculated and uninoculated sulphur, little difference in the control of scurf followed. More injury to the roots resulted from the use of the latter material. In resistance studies it was found that the Red Brazil and Dahomey varieties were resistant; the Dooley, Pumpkin and White Yam slightly infected; the Triumph, Red Jersey, Big Stem Jersey, Gold Skin, and Porto Rico varieties were found to be severely infected; while the Yellow Jersey and Nancy Hall varieties proved to be the most susceptible.—*Wm. H. Martin.*

9145. Poole, R. F. **The relation of soil moisture to the pox or ground rot disease of sweet potatoes.** Phytopathology **15**: 287–293. *Fig. 1–4.* 1925.—Several observers have reported that pox or soil rot (*Cytospora batatas*) of sweet potatoes (*Ipomoea batatas*) was much more destructive during dry than during rainy seasons, with various conclusions as to the significance of this fact. To determine this point the author set up a series of experiments in which the plants were grown in pots of infected soil in which soil moisture was maintained at various degrees of saturation. The roots of plants of the Triumph variety were not attacked at 20% (saturation) or at 15% moisture, slightly at 10%, and very severely at 2 and 5%. Some of the pots with saturated soil were allowed to dry out to 2% moisture and held for 14 days at the end of which time the roots had become severely infected. The largest growth of potatoes was obtained at 10–16% moisture, which suggests that irrigation may be profitable on certain infested soils.—*B. B. Higgins.*

9146. Potter, Alden A., and Leo E. Melchers. **Study of the life history and ecologic relations of the smut of maize.** Jour. Agric. Res. **30**: 161–173. *Pl. 1–3, fig. 1–2.* 1925.—Corn smut is becoming more prevalent and destructive in Kansas and is an important factor in corn production in the Great Plains area where corn is grown. Extensive fungicidal treatments in the form of sprays show that apparent smut control has been due chiefly to host injury, resulting in a reduced vegetative activity, a circumstance which involves a correspondingly lessened production of smutted tissues. Whenever the amount of smut was lessened by fungicides a similar reduction in yield occurred. Planting numerous varieties of corn on several successive dates in an attempt to avoid infection gave negative results. Inbred lines of corn may be secured from practically any variety, which show great variations in susceptibility and resistance to smut.—An ecologic study covering 4 years has indicated that moisture is not a limiting or controlling factor in the occurrence of corn smut. Infection does not depend so much on the time of the season as on the stage of development of the host plant. The organism was isolated from soil, air, and leaf axils, grown on artificial media, and used for inoculation by means of hypodermic needles in order to prove that the cultures were pathogenic. Studies are in progress on the corn smut organism to discover whether physiologic strain differences may exist in *Ustilago zeae.*—*L. E. Melchers.*

9147. Pritchard, Fred J. **Tomato wilt and its control.** Market Growers Jour. 35^7: 6. 1924.—The writer discusses the cause of the disease, symptoms, relation of temperature to wilt, and methods of control, especially the development of wilt-resistant varieties of which he lists and describes 8.—*H. C. Thompson.*

9148. Pritchard, Fred J., and W. S. Porte. **The control of tomato leaf spot.** U. S. Dept. Agric. Bull. 1288. *1–19. Pl. 1–2, fig. 1–9.* 1924.—As the leaf spot fungus (*Septoria lycopersici* Speg.) has a high minimum sporulation temperature, namely, 59°F., and therefore seldom infects tomato plants in the field in the Middle Atlantic and Middle Western States—the region where it is severe—before June 15–30, leaf-spot epidemics can be largely avoided by setting out large, stocky, well-hardened plants early in the spring. This fungus over-winters chiefly on the old tomato vines and spreads to dead weeds and remains of various crops, where it grows, sporulates, and subsists saprophytically from year to year. Thoroughly plowing under the old vines at the end of the picking season and keeping all plant debris completely buried robs the fungus of its food supply and greatly reduces its chances of subsistence, as it can not live over winter when thoroughly covered with soil. The common practice of disking instead of plowing under the old tomato vines in the fall is doubtless largely responsible for leaf spot epidemics in the U. S. A., as the old vines left lying on the surface of the soil furnish excellent material for the overwintering and saprophytic development of the fungus. The destruction of horse nettle, ground cherry, jimson weed, and the night-shade, on which the leaf spot fungus lives as a parasite, the burning of dead weeds and grasses along fence rows and in other waste places, and the practice of clean culture will aid in the control of this disease.—*F. J. Pritchard.*

9149. Reed, George M., and James A. Faris. **Influence of environal factors on the infection of sorghums and oats by smuts II. Experiments with covered smut of oats and general considerations.** Amer. Jour. Bot. **11**: 579–599. *3 fig.* 1924.—The influence of the temperature, moisture and reaction of the soil to the infection of 2 varieties of oats by *Ustilago levis* and of several varieties of sorghum by *Sphacelotheca sorghi* and *S. cruenta* were studied. *Avena nuda* var. *inermis* was infected at all temperatures from 5 to 30°C., the infection being highest at 25°. *A. sativa* var. *Victor* was also infected at all temperatures but consistently gave results lower than *A. nuda* except at 30°. The highest percentages of infection were obtained in the lower soil moistures. Soil near the neutral point or only slightly acid was most favorable for high infections. Infection of susceptible varieties of sorghums occurred over a wide range of temperature and moisture, with particularly high infection at the lower moistures. Infection also occurred over a rather wide range of soil reaction, slightly acid soils being most favorable for it.—The results with *Sphacelotheca sorghi* and *S. cruenta* were very similar. Varieties resistant to these smuts were grown at a number of different temperatures and moistures but consistently maintained their freedom from infection. Soil temperature, soil moisture and soil reaction are interdependent factors and any one of them may be a limiting one in the prevention of infection.—*E. W. Sinnott.*

9150. Reed, George M., Marion A. Griffiths, and Fred N. Briggs. **Varietal susceptibility of oats to loose and covered smuts.** U. S. Dept. Agric. Dept. Bull. 1275. *1–39. Pl. 1–3.* 1925.—Studies on the varietal resistance and susceptibility of oats to *Ustilago avenae* (Pers.) Jens. and *U. levis* (K. and S.) Magn. were carried out on various strains and varieties of oats at Columbia, Missouri; Ames, Iowa; Manhattan, Kansas; Aberdeen, Idaho; Pullman, Washington; and Brooklyn, New York. The strains and varieties at the widely separated stations gave similar results. (1) Five of the 6 strains of *Avena brevis* were very similar and gave negative results except in 1 doubtful case. The 6th strain was later maturing and showed slight infection with *U. levis*. (2) All 3 of the strains of *A. fatua* were susceptible. (3) Four of the 5 strains of *A. ludoviciana* were moderately susceptible; the other 1 was highly resistant. (4) The 7 strains of *A. nuda* were highly susceptible. (5) There was great variation in susceptibility among the 90 varieties and 182 strains of *A. sativa*. A few proved to be very resistant, including Black Mestag, Culberson, Caucausus, Danish Island, and Siberian. A large number were highly susceptible but the greater number of varieties were placed in groups intermediate between the 2 extremes. Some varieties appeared to manifest a greater susceptibility to one smut than to the other. (6) All 24 of the varieties of *A. sativa orientalis* were susceptible. (7) The wild forms of *A. sterilis* were moderately susceptible but the cultivated forms such as Burt, Fulghum, and Red Rustproof possess a marked resistance to both smuts. (8) All 4 of the strains of *A. strigosa* were completely resistant.—Results obtained in the greenouse were comparable to those obtained in the field. Under greenhouse conditions the formation of pustules of smut spores on the upper leaves of susceptible varieties was conspicuous in both smuts.—*Fred N. Briggs.*

9151. Rhoads, Arthur S. **The principles and practices in the prevention of grape diseases.** Florida Fruits and Flowers 3^1: 16, 18–20. 1925.—The following 4 most important means of control are discussed: (1) Selection of a suitable vineyard site; (2) selection of varieties adapted to the site; (3) vineyard sanitation; and (4) spraying and dusting.—The grape varieties most commonly grown in Florida are classified according to their resistance and susceptibility to fungous diseases.—*Arthur S. Rhoads.*

9152. Sampson, Kathleen, and D. W. Davies. **Dry treatment for smut diseases of cereals.** Welsh Jour. Agric. **1**: 169–176. 1925.—A brief summary is given of the more important papers which have been published during the last 7 years on dry treatment for smut diseases of cereals. The subject is discussed under 3 headings: (1) the use of dry copper carbonate to control bunt of wheat; (2) the use of copper carbonate to control seed borne diseases other than bunt of wheat; and (3) experiments with diluted copper carbonate and other chemical dusts.—A list of 35 references is given.—*Authors.*

9153. Schaffnit, E., und L. Rump. **Beobachtungen ueber Rostkrankheiten des Ge-**

treides. [Observations on rust diseases of the cereals.] Mitteil. Deutsch. Landw. Ges. 38: 624–628, 639–642. 1923.—A synopsis of observations on the susceptibility of wheat varieties to yellow rust, and the influence of fertilizers upon the infection. A brief review of the life cycles of cereal rusts is given in the introduction. Observations on the effect of various fertilizers upon the development of black rust were made in only 1 year. The attacks of black rust (*Puccinia graminis*) were much lighter in all plats treated with Thomas flour and lime. This rust-checking effect was accredited to their hastening the maturity of the cereals. Plats treated with gypsum showed the severest attacks. Observations on the degree of infection of 39 varieties of winter wheat by yellow rust (*Puccinia glumarum*) showed Mette's Raubweizen and Kraffts' Improved Siegerlander to be the most resistant and at the same time the best yielders. Observations on 7 spring wheats showed Rud. Betge's original 19 to be somewhat resistant. No uniform results were obtained with respect to attacks by yellow rust when the plants were fertilized with different fertilizers. Potassium appeared to reduce the rust attacks and there was no indication of the nitrogen favoring the attacks.—*H. B. Humphrey.*

9154. Stakman, E. C., and O. S. Aamodt. **The effect of fertilizers on the development of stem rust of wheat.** Jour. Agric. Res. 27: 341–380. *3 pl., 4 fig.* 1924.—In experiments covering a period of 8 years on several soil types in different parts of Minnesota, the plants were grown under heavy artificially induced epidemics, and under natural field epidemics. The effect of barnyard manure, clover soil, alfalfa soil, and cabbage soil, with and without fertilizers, was tried in the field. In addition, various amounts of sodium nitrate, acid phosphate, and potassium chlorid or potassium sulphate, alone and in combinations with each other, were added to soils to determine the effect on infection of wheat by rust. The degree of physiologic susceptibility of susceptible and resistant varieties apparently was not changed directly by the use of different fertilizers, although morphologic resistance may be changed slightly. Plants growing in plats heavily fertilized with nitrogenous manures were sometimes more heavily attacked by stem rust than those in other plats. This apparently was an indirect effect due to increased density of stand and delayed maturity, which made conditions for infection more favorable and lengthened the time during which the plants could become infected. There is some evidence that the amount of orange leaf-rust may be increased by the use of nitrogenous fertilizers. The date of maturity, degree of lodging, crinkling, shriveling of seed, percentage of yellow-berry, and yield of straw and grain may be affected profoundly by different fertilizers. On some soils and under certain weather conditions, heavy fertilization with nitrogen decreases the yields greatly by increasing the proportion of straw to seed, by inducing lodging and by burning out. This probably has been confused with rust injury. On soils deficient in nitrogen, barnyard manure and nitrates increased the yields without increasing the severity of attack by stem rust. Neither acid phosphate nor potassium counteracted the harmful effects of excessive fertilization with nitrogen on some soils. On properly fertilized soil, wheat yielded well in spite of heavy attacks of stem rust. While the direct effect of fertilizers on the development of stem rust seems to be slight, there is sometimes a profound indirect effect. It is advisable, therefore, to avoid excessive fertilization with nitrogen and to use phosphates and potassium fertilizers on those soils which need them. Rust damage can be reduced in this way.—*Authors.*

9155. Stevens, Frank Lincoln, and O. A. Plunkett. **Tulip blossom blight.** Illinois Agric. Exp. Sta. Bull. 265. *299–307. Fig. 1–7.* 1925.—This is the 1st report of the presence of tulip blossom blight. The causal organism is a Phytophthora and is closely allied to, if not identical with, *P. Cactorum.* A description of the fungus is given. The disease occurs as a lesion either just below the blossom or at the base of the upper leaves. The fungus usually enters the plant through the blossom or else by penetrating the epidermis in the leaf axil. Damp, shady situations, are almost entirely responsible for the prevalence of the disease. The fact that double blossoms hold moisture for a much longer period than single blossoms undoubtedly accounts for the greater susceptibility of the former. Iris was susceptible to inoculation. Avoidance of humid conditions is the only control recommendation offered.—*H. A. Lunt.*

9156. Stone, R. E. **Root rot or blight of canning peas.** (Abstract.) Phytopathology 15: 300. 1925.

9157. Taubenhaus, J. J. **A new foot rot of the sweet potato.** Phytopathology **15:** 238–240. *Fig. 1.* 1925.—A foot rot of sweet potato [*Ipomoea batatas* Poir.] and tomato [*Lycopersicum esculentum* Mill.] has been found by the author in Delaware and also in Texas. Lesions occur on the young stems near the surface of the soil and isolations from these tissues often gave pure cultures of a Macrosporium. Cultures of the Macrosporium from both hosts were broken up in sterile water and poured around healthy young sweet potato and tomato plants growing in sterilized soil. Typical lesions were produced on a large percentage of the inoculated plants by cultures from each source. From this result and from the similarity in morphological characters the conclusion is drawn that a single organism attacks both host plants. Experiments are now under way to determine the relation of this fungus to that causing the early blight of Irish potatoes [*Solanum tuberosum* L.].—*B. B. Higgins.*

9158. Thomas, H. E. **Apple blotch in New York State.** Phytopathology **15:** 246–247. 1925.—Apple blotch (*Phyllosticta solitaria* E. & E.) has recently been found in several lots of seedling apple trees originally shipped into the state from Iowa. Apparently the disease does not spread rapidly under New York State conditions and may not become serious there.—*B. B. Higgins.*

9159. Tisdale, W. H. **Seedling blight and stack burn of rice and the hot water seed treatment.** U. S. Dept. Agric. Dept. Bull. 1116. *1–11. Pl. 1–16, fig. 1–2.* 1922.—The heavy losses to the rice crop in the southern part of the U. S. A. due to staining in shock and storage are caused by the attacks of a number of fungi which thrive under the warm humid conditions existing in that region. A sclerotial fungus of the *Mycelia sterilia* group was found to be the most common form present in stained and decayed rice; three distinct strains were found. *Helminthosporium* and *Piricularia* were found to cause staining, decay and seedling injury. Other genera were present but the amount of injury caused by them is not known. The seedling injury caused by these fungi when infected seed is sown can be prevented to a certain extent by the hot-water seed treatment, but it is not practicable for preventing storage injury. The development of resistant varieties appears to be the most promising solution of this problem.—*Author.*

9160. [Voronikhin. N. N.] Воронихин, Н. Н. **Об исследовании некоторых сульфокислот и солей их с точки зрения возможности применения их В качестве фунгицидов. [Observations on various sulphon-acids and their salts as fungicides.]** Записки научно-прикладных отделов тифлиского Вотанического Сада [Sci. Papers Appl. Sect. Tiflis Bot. Gard.] 3: 65–89. 1924.—Experiments were made on the effect of alphanaphthol sulphonic acid on different fungi. It was found that as a fungicide, Bordeaux mixture is more effective than the alpha-naphthol sulphonic. Grape vines treated with this chemical show a larger amount of grapes affected with mildew than those treated with Bordeaux mixture.—*L. J. Pessin.*

9161. Wadham, S. M. **Observations on clover rot (Sclerotinia trifoliorum Eriks.).** New Phytol. 24: 50–56. *2 fig.* 1925.—The mycelium of the fungus is readily cultivated and on various media forms sclerotia which are exceedingly resistant and readily give rise to mycelia. Apothecial shoots are positively heliotropic and form apothecia only when brightly illuminated. The spores give rise to a mycelium which is at first saprophytic and then facultatively parasitic. Remedial measures, to be effective, must deal with the mycelium. Reducing the density of the stand of clover or destroying the layer of detritus on the soil decreases the rate at which the fungus spreads.—*I. F. Lewis.*

9162. Wallace, Errett. **Seven years tests with commercial dusting materials against potato blight.** Proc. 11th Ann. Meeting Potato Assoc. America **1924:** 86–95. 1925.—The experimental studies upon which this paper is based were begun in the season of 1917 and were designed to test the efficacy of the principal types of commercial fungicides found on the market, which are or were recommended for the control of late blight. None of the dusts used previous to 1924 gave satisfactory results under the conditions of their application. Fairly satisfactory results were secured from dust applications made between 3 and 5 o'clock in the morning. Chemical determinations of the amount of copper adhering to leaves of plants showed a relatively large amount on leaves sprayed with Bordeaux mixture and almost but not quite as much on those to which copper-lime dusts were applied early in the morning.—*W. Stuart.*

DISEASES CAUSED BY BACTERIA

9163. Brown, Nellie A. **A new bacterial disease of tomato fruits.** Science 62: 12–13. 1925.—A yellow, polar-flagellate species has caused serious losses in packed fruit from Texas and Nebraska. Infection is to be noted in green fruit by the presence of a little brown spot or a dark ring around and under the stem; most of the infection of the fruit occurs at this point, where the cuticle ends. Other parts of the plant are unaffected.—*C. J. Lyon.*

9164. Dufrenoy, Jean. **Les tumeurs des resineux. [The tumors of conifers.]** Thesis, University of Paris. *P. 1–169. Fig. 1–115.* Paris, 1925.—In Part I, following the introductory pages of this monograph, the author takes up the classification of the tumors of conifers, traumatic tumors, experimental tumors of *Picea excelsa*, the tumors of *Pinus Halepensis* and *P. Cembra*, and witches' broom.—In Part II he discusses the culture of the bacteria of the Aleppo pine and of the tumors of *Picea excelsa.*—Part III comprises a histological study, including discussions of the cambium, the tumor wood, the ligneous and secretory parenchyma and the pith of the tumors.—Part IV comprises a discussion of the author's studies of the embryonic cells, and Part V his physiological and biological studies.—The author studied hitherto undescribed tumors on *Pinus silvestris*, *P. montana*, *P. maritima*, *Picea excelsa*, and *Taxodium sempervirens*, attributing them to bacterial action and comparing them to previously described tumors of *Pinus Halepensis* and *P. Cembra.* From *P. Halepensis* a yellow bacterium was isolated, having the characters of the organism (*Pseudomonas Pini*) obtained by Petri in 1922 from tumors of *Quercianella.* It is also shown that the tumors of *Picea excelsa* are transmissible by inoculation, and an organism identical with *Pseudomonas Pini* was isolated from them. From the similarity of reaction phenomena demonstrated in various tumors the author concludes that the incitant reactions differ largely in the degree of intensity rather than in the quality of their effects; up to a certain point the excitant, whatever be its origin, increases all the forms of metabolic activity; it increases growth, tending to hypertrophy and hyperplasia; it augments the secretory function, increasing the size and number of secretory cells. On the other hand, if excessively strong, the excitant results in necrosis of the tissues. It is concluded, then, that the anatomical, histological and cytological reactions observed in the various tumors depend very little upon the nature of the causal organism but rather upon the histogenic capacity of the particular meristem concerned and on the length of time during which the parasitic irritation or its effects persist. The bacterial tumors may acquire a characteristic degree of complexity over those of simpler origin due to the fact that the relative equilibrium between irritating agent and host allows the former to act over considerable periods of time.—The ultimate cause of the tumors lies in an increase in the power of the living cell to grow; that is, in an increase in the power of hydration and imbibition of its cytoplasmic contents or in an increase in the osmotic tension of the cell sap.—*Frederick V. Rand.*

9165. Durrell, L. W., and W. G. Sackett. **A root rot of alfalfa.** Science 62: 82–83. 1925.—A rotting of the roots of alfalfa in many fields in Colorado has resulted in the wilting and death of the shoots. The vascular system is plugged and the stored starch in the roots is nearly or quite absent. A fluorescent bacterium has been isolated and shown by well-controlled inoculation tests to be the causal organism.—*C. J. Lyon.*

9166. Jones, Fred Reuel. **A new bacterial disease of alfalfa.** Phytopathology 15: 243–244. 1925.—During last year fields of alfalfa in Illinois and Wisconsin were noted in which the plants were dying over extensive areas. In plants exhibiting symptoms of disease the roots showed discoloration and in advanced cases the bark slipped off easily. The woody vessels just under the bark were discolored and contained masses of bacteria. Cultures of these bacteria produced similar symptoms in inoculated plants.—*B. B. Higgins.*

9167. McLarity, H. R., and T. M. C. Taylor. **A bacterial disease of tomatoes new to British Columbia.** (Abstract.) Phytopathology 15: 302. 1925.

9168. Martin, Wm. H. **The use of organic mercury for disinfecting seed potatoes.** Proc. 11th Ann. Meeting Potato Assoc. America 1924: 116–121. 1925.—Nickel and copper carbonates in dust form were used at the rate of 4 ounces per bushel of scabby seed potatoes; 2 proprietary organic mercury dusts were also tested. The most effective coating of the surface of the tuber was secured by treating before cutting. Nickel carbonate caused the seed pieces to decay. Copper carbonate retarded sprouting and produced a poor stand. The mercury dusts applied before cutting did not materially affect time of sprouting but did produce a slightly better stand than the checks. However, where the dust was applied after cutting, there was a marked stimulation of sprouting. The mercury dusts applied before cutting did not affect the yield markedly, but the dust applied after cutting caused a marked increase in yield. In all cases the mercury dusts greatly reduced the percentage of scabby potatoes in the crop, as compared to the untreated checks. A duplicate set of tests on soil heavily infested with the scab organism showed little differences in the amount of scab in the resultant crop. *J.— T. Rosa.*

9169. Martin, Wm. H. **The use of sulfur for the control of potato scab—1922 results.** New Jersey Agric. Exp. Sta. Ann. Rept. **44**: 348–355. 1923 [1924].—In continuation of previous experiments the results are reported of studies conducted in 1922. With the different amounts of sulphur used, all gave substantial increases in the number of clean tubers. In most instances, the greatest increase was recorded on the plots receiving sulphur at the rate of 600 pounds per acre. Inoculated sulphur gave better returns than the uninoculated, in several instances an application of 300 pounds of the former material giving as efficient control of scab as 600 pounds of latter.—The results of a test to study the influence of nitrate of soda and sulphate of ammonia on the development of scab show that where the former material was used as the only source of nitrogen in a complete fertilizer, only 4.6% of the tubers were clean as compared with 42.6% where sulphate of ammonia was used.—An experiment to determine the combined influence of seed disinfection and sulphur applications on the control of scab where scabby seed is planted, showed that where scabby, untreated seed was planted 56.3% of the tubers were clean as compared with 77.1% for the seed disinfected in hot formaldehyde. Untreated and treated seed planted on plots receiving sulphur at the rate of 300 pounds per acre showed 86.2 and 95.8% scab, respectively.—*Author.*

9170. Moore, E. S. **Wildfire of tobacco in South Africa and control measures.** Jour. Dept. Agric. Union of South Africa **9**: 211–215. 1924.—A description of this disease (*Bacterium tabaci*) is given and combative measures are discussed. The precautions suggested extend over the whole growing season, from the first preparation of the seedbed to the final clear up of field and shed after harvesting. There is every reason to hope that with due attention to the control measures suggested, which aim at the production of disease-free seedlings and elimination of diseased plants in the field, the grower need have little cause for pessimism with regard to future losses through wildfire. During the last 4 years this disease has caused losses in Rhodesia, Transvaal, Eastern Cape Province, and in Swaziland. In 1923–1924 it appeared in the Turkish tobacco districts of the Western Cape Province.—*L. I. Goldblatt.*

9171. Pinoy, P.-E. **A propos du cancer des plantes ou crown gall. [Concerning the cancer of plants or crown gall.]** Compt. Rend. Acad. Sci. Paris **180**: 311–313. 1925.—Erwin F. Smith regards the bacteria of crown gall as being located in the inclusions of the cell. Riker finds them in the intercellular spaces. Further study shows that the bacilli are contained in special tannin cells. Riker may have been confused by *B. fluorescens* which in tomato and tobacco always occurs in the intercellular spaces.—*C. H. Farr.*

9172. Tubeuf, [H.] von. **Gefässbewohnende Bakterien im Holze von Bäumen als Verursacher tödlicher Krankheit. [Bacteria inhabiting the vessels in the wood of trees as causes of fatal disease.]** [Rev. of: Day, W. R. **The watermark disease of the cricket-bat willow.** Oxford Forest. Mem. 3. *1–30. Fig. 1–17.* 1924 (see Bot. Absts. 14, Entry 6542); and Brussoff, A. **Die holländische Ulmenkrankheit—eine neue Bacteriose. (The Dutch elm disease.)** Centralbl. Bakt. II Abt. 63^2: 256 ff. 1924–1925.] Forstwiss. Centralbl. **47**: 348–351. 1925.—The reviewer mentions several papers on the elm disease which were not cited by Brussoff. The diseases seem so similar that he suggests inoculation of willow with *Micrococcus ulmi* and elm with *Bacterium salicis*, in order to determine whether or not they are the same. The wide distribution of the elm disease suggests the danger of a serious epidemic.—*W. N. Sparhawk.*

9173. Waite, M. B. **Pear blight infection of rose cuttings and of mature fruit.** Official Rec. [U. S. A. Dept. Agric.] 4^{31}: 5. 1925.—After noting some of the salient points in the biological relations of *Bacillus amylovorus* the author details experiments showing that this germ is keenly influenced by water in the tissues and by humidity of the air surrounding host or host parts under observation. Pear blight occasionally attacks summer apples up to maturity but has never been found on mature winter apples or pears at harvest time or during winter storage, and under ordinary inoculation conditions the organism will not attack such fruit. The author shows, however, that under damp chamber conditions *B. amylovorus* can attack the tissues of mature, winter apples, and also rose cuttings. Roses have never been found attacked by pear blight out of doors.—*Frederick V. Rand.*

DISEASES CAUSED BY ANIMAL PARASITES (INSECTS, NEMAS, PROTOZOANS, ETC.)

9174. Bensaude, Mathilde. **Flagellates in plants: a review of foreign literature.** Phytopathology 15: 273–281. 1925.—A brief history of the discovery of flagellates in plants and of the development of our present knowledge concerning them is given. The 1st report of a flagellate parasite in plants was made by Lafont in 1909, in which he described *Leptomonas davidi* found inhabiting the latex of 3 species of *Euphorbia.* Since then what appears to be the same organism in various species of Euphorbia has been reported by various authors from many countries. The effect of the parasite on the host plants is uncertain. Some authors claim that the plants show no evidence of injury while others say that there is a distinct yellowing, destruction of the starch grains in the latex and in the neighboring parenchyma cells and, finally, destruction of the chloroplasts.—The flagellate is transmitted from plant to plant by one or more species of insects which act as intermediate hosts in which it completes its life history. It over-winters in hibernating insects and also in the plant hosts. Two other flagellates have been reported from milkweeds in South America, *Leptomonas elmassiani* Migone from *Araujia angustifolia* and *L. bordasi* França from *Morrenia odorata.* Franchini has recently reported finding protozoa in a large number of lactiferous plants but, as yet, has not studied the life history of these organisms.—*B. B. Higgins.*

9175. Bledsoe, R. P. **Methods of boll weevil control.** Georgia Agric. Exp. Sta. Circ. 78. *1–8.* 1924.—The author discusses varieties of cotton under boll weevil conditions, problems of fertilization, and the following methods of control: Cultural methods, mixture of molasses and calcium arsenate, dusting with calcium arsenate, and the Florida method of removing squares during the early growth of the plant. He recommends cutting the acreage, good cultivation, fertilization and poisoning before the squares fall, following this with dusting when infestation reaches 10 to 15%.—*T. H. McHatton.*

9176. Bonnett, L. O. **Phylloxera resistant vineyards.** California Agric. Exp. Sta. Circ. 288. *1–24.* 1925.—This circular discusses the resistance of vineyards to Phylloxera under the following headings: Insect; injury to vine; degrees of susceptibility; means of defense, (1) prevention, (2) cure, (3) immunity; resistant root stocks; and grafted resistant vines.—*A. R. C. Haas.*

9177. Campbell, R. E. **Notes on nicotine dust progress.** Jour. Econ. Entomol. 16: 497–501. 1923.—This general historical account of the use of nicotine in dusts is given with special reference to recent developments, the properties of carriers, the utilization of finely ground tobacco dust, the comparative merits of free nicotine and nicotine sulphate, the advisability of a certain amount of moisture, the mechanical devices for the application of dusts, data on self-mixing dusters and the possibilities of local mixing.—An extended bibliography is included.—*Author's abstract.*

9178. Chandler, S. C. **Some recent developments in the use of Paradichlorobenzene.** Jour. Econ. Entomol. 17: 246–253. 1924.

9179. Cook, F. C., and N. E. McIndoo. **Chemical, physical, and insecticidal properties of arsenicals.** U. S. Dept. Agric. Dept. Bull. 1147. *1–57.* 1923.—A study of the chemical, physical, and insecticidal properties of arsenicals on the market in 1916 was undertaken in order to gain a better understanding of them, to be able, if possible, to improve them, and to produce new arsenicals for insecticidal purposes. The following already known commercial arsenicals were studied—arsenic oxids, basic and acid lead arsenates, the comparatively new calcium and magnesium arsenates, Paris greens, zinc arsenite, London purple, sodium and potassium arsenates. The following were prepared and tested by the authors—the arsenates of lead, calcium, barium, zinc, copper, copper barium, and aluminum; the last 3 being made for the first time. These were tested against 7 species of insects: Silkworms (*Bombyx mori* L.), fall webworms (*Hyphantria cunea* Dru. and *H. textor* Harr.), tent caterpillars (*Malacosoma americana* Fab.), potato-beetle larvae (*Leptinotarsa decemlineata* Say), grasshoppers (*Melanoplus femur-rubrum* De G.), and honeybees (*Apis mellifica* L.). There are 53 references cited. —*N. E. McIndoo.*

9180. Davis, J. J. **Comparative tests with dormant sprays for San Jose scale control.** Jour. Econ. Entomol. 17: 285–290. 1924.

9181. Dudley, J. E., and E. M. Searles. **Color marking of the striped cucumber beetle (Diabrotica vittata Fab.) and preliminary experiments to determine its flight.** Jour. Econ. Entomol. 16: 363–368. *1 fig.* 1923.—The widespread depredations of the striped cucumber beetle, including both its feeding injuries and its role in the transmission of bacterial wilt and mosaic of the cucurbits, have been estimated to damage the crop to the extent of $3,000,000–$5,000,000 a year in the U. S. A. Many of the recognized control measures in the past have been of little or no value in killing the beetle, and their virtue as repellents has depended upon repeated applications to the growing crops because the beetles are constantly flying from field to field. This project was undertaken to find the limits of the powers of flight of the beetle and its general habits as to flight. After experiments with various dyes and coloring substances covering a period of 3 years, the most successful material for marking has been found to be 6 parts, by volume, of denatured alcohol (denatured with methyl alcohol), 4 parts of commercial, cut shellac, the mixture colored with a saturated solution of various aniline dyes in alcohol. This material may be sprayed on the beetles with an atomizer. It dries quickly; adheres well to the body of the insect; retains its color indefinitely; and does not appear to interfere in any way with the normal functions of the insect. During the summer of 1922, three lots of beetles totaling 25,786 individuals, were marked and released. Of these, 49 were recovered after an average interval of 4½ days. They flew an average distance of ½ mile, 5 flying over a mile each. This project is to be continued during the season of 1923.—*Authors' abstract.*

9182. Dustan, Alan G. **A fungous parasite of the imported apple sucker (Psyllis mali Schmid).** Agric. Gaz. Canada 10^1: 16–19. 1923.—A successful attempt was made at Wolfville, Nova Scotia, to artificially spread the fungous parasite, *Entomophthora sphaerosperma*, in a number of orchards infested with the apple sucker. Leaves bearing diseased adults from a fungus infested orchard were pinned to leaves in orchards to be infected. Adults still alive were collected and liberated in the orchards under experiment. Both methods gave good results. True apple sucker was practically exterminated in a heavily infested 5-mile area in the Annapolis Valley.—*O. W. Dynes.*

9183. Fenton, F. A., and J. H. Trundy. **Bordeaux mixture as a control for leafhoppers.** Jour. Econ. Entomol. 16: 314–317. 1923.—Tests conducted with home-made Bordeaux mixture, 4–4–50 formula and also with 3 proprietary preparations of this compound, indicate that these spray materials are toxic to the nymphs of at least 1 common and injurious cicadellid, namely, *Empoasca mali* Le B. They also are apparently toxic to the nymphs of 3 other species of leafhoppers, namely, *Empoa rosae* Linn., *Erythroneura comes* Say, and *E. tricincta* Fitch. The young nymphs are more susceptible to the action of the Bordeaux than the older ones, while the adults, although they are repelled from plants sprayed with this preparation, are not affected when forced to feed from treated leaves. Bordeaux mixture should therefore be classed as a specific insecticide for certain species of leafhoppers.—*Authors' abstract.*

9184. Ferguson, D. B. **Fumigation of citrus trees. Notes on recent developments in California.** Agric. Gaz. New South Wales 36: 437–444. *7 fig.* 1925.—Methods of citrus tree fumigation with hydrocyanic acid as used in California are described, with notes on possible adaptations needed for use in Australia.—*L. R. Waldron.*

9185. Flint, W. P., J. C. Hackleman, and F. C. Bauer. **Begin to fight the corn borer now.** Illinois Agric. Exp. Sta. Circ. 274. *1–8. Fig. 1–5.* 1923.—The European corn borer, its life history, origin, area of infestation, manner of injury to corn, and its control are briefly described.—*H. A. Lunt.*

9186. Fryer, J. C. F. **The insect enemies of farm crops.** Welsh Jour. Agric. 1: 190–194. 1925.—The article presents for the benefit of extension workers in Wales certain considerations in regard to the practical control of insect pests. The great importance of the cost of remedial or preventive measures is emphasized and it is pointed out that under the present economic conditions the farming industry cannot afford to use expensive measures, a consideration which much hampers the research worker. A summary of the chief lines along which relief from insect pests must be sought is given.—*Author.*

9187. Headlee, Thomas J. **Dusting vs. spraying for the control of potato aphis.** Proc. 11th Ann. Meeting, Potato Assoc. America **1924**: 77–84. 1925.—A field study of the relative value of nicotine sprays and dusts for the control of the pink and green aphis on potatoes indicated that the dust, containing 1% free nicotine, was much the more effective. With reference to limiting factors influencing the effectiveness of dusts and the rate of evolution of nicotine gas, it is pointed out that the chemical combination in which the nicotine occurs is important. In tobacco dust the evolution of gas is very slow. Acid tobacco dusts give up their nicotine much less rapidly than alkaline dusts. Free nicotine extract evolved the gas more rapidly than any other form, but nicotine sulphate can be made to evolve the gas rapidly by splitting off the sulphate radical. This is accomplished by the use of Ca and Mg carbonate as a carrier for the dust. Low humidity favors the effective use of nicotine dusts. The temperature should be 70°F. or higher, for the rate of evolution of nicotine gas increases as the temperatuer.—*J. T. Rosa.*

9188. Holmes, Francis O. **Geographical distribution of the milkweed flagellate, Herpetomonas elmassiani** (**Migone**). Phytopathology **15**: 297–299. *Fig. 1.* 1925.—This organism was first found inhabiting the latex of *Araujia angustifolia* in Paraguay during 1916. In 1923 it was found in the latex of *Asclepias syriaca* in Maryland. More recently it has been reported from Honduras and Haiti. Results of an attempt to establish the northern limits of its range indicate that it coincides approximately with the northern boundry of New Jersey. This is also the northern limit of the range of *Oncopeltus fasciatus* Dallas which is suspected of being the insect host of the flagellate.—*B. B. Higgins.*

9189. Holmes, Francis O. **Non-pathogenicity of the milkweed flagellate in Maryland.** Phytopathology **15**: 294–296. 1925.—The flagellate, *Herpetomonas elmassiani* Migone, produces no visible injury to milkweed (*Asclepias syriaca* L.) plants even when the latex shows heavy infestation early in the spring.—*B. B. Higgins.*

9190. Howard, Neale F. **The Mexican bean beetle.** Market Growers Jour. 34^7: 275. 1924.—A discussion of the distribution, life history, food plants and control measures.—*H. C. Thompson.*

9191. Howard, Neale F., and L. L. English. **Studies of the Mexican bean beetle in the Southeast.** U. S. Dept. Agric. Bull. 1243. *1–50. Pl. 1–12, fig. 1–16.* 1924.—The Mexican bean beetle, a serious pest of beans, was introduced into the East in 1920. Records of its spread, research work on its biology, and control, are reported, to be followed later with a more complete account.—New host plants are reported. The discovery of the hibernating habits of the beetle and complete data on hibernation under natural conditions and in cages are given.—A number of new predacious enemies and 3 internal parasites are reported.—Effects of sunlight are given, the immature stages being very sensitive to the direct rays of the sun during the hot summer in Alabama.—Brief data on the biology and life history are included and the habits of the beetle and injury to the bean plant described. New data on the effect of insecticides on bean foliage is presented. Magnesium arsenate is used successfully for the 1st time for the control of this insect without injury to the foliage. Complete control practices are outlined and reports of a large number of field experiments are given in tabular form. A discussion of each of the following arsenicals is given: Magnesium arsenate, basic lead arsenate, zinc arsenite, calcium arsenate, and lead arsenate.—*N. F. Howard.*

9192. Hyslop, J. A. **Summary of insect conditions throughout the United States during 1921.** U. S. Dept. Agric. Bull. 1103. *1–51. Fig. 1–28.* 1922.—In this paper the object and scope of the work of the Federal Insect Pest Survey is set forth, and its methods of procedure and organization are discussed. It outlines the zoogeographic regions used in the Survey's investigations, gives a general climatological summary for the entomological season of 1921 and correlates this climatological data with the insect conditions prevailing during that year. Nineteen of the more important insect pests are reviewed as typical of the data which the Survey is collecting on all pests upon which it receives reports.—*Author.*

9193. Knight, Hugh. **Factors affecting efficiency in fumigation with hydrocyanic acid.** Hilgardia 1: 35–56. *Fig. 1–10.* 1925.

9194. Leach, B. R., W. E. Fleming, and J. P. Johnson. **Soil insecticide investigations at the Japanese beetle laboratory during 1923.** Jour. Econ. Entomol. 17: 361–365. 1924.—The experimental work throughout the year with *Popillia japonica* has been carried on with the object of evolving methods of chemically treating the soil about the roots of such plants as conifers, boxwoods, azaleas, rhododendrons, hydrangeas, ferns, blueberries and perennials for the control of the soil stages of the Japanese beetle. Emulsions of carbon disulphide and wormseed oil have proved satisfactory in these connections and are now in use by the local nursery and greenhouse concerns.—*Authors' abstract.*

9195. McClintock, J. A. **Report on resistant plants for root-knot nematode control.** Georgia Agric. Exp. Sta. Circ. 77. *1–4.* 1922.—The author discusses the prevalence of the nematode, *Heterodera radicicola,* in the Southern States and suggests the following plants as resistant and usable in rotations for starving out the pests: onions; Iron, Brabham and Victor varieties of cowpea; and Biloxi, Laredo and O-too-tan soy beans; and also the varieties of velvet beans and peanuts which show a high resistance. A report is further given on seedling peach trees grown from pits obtained from Florida, which appear to be resistant. It has been observed also that wild plums and cultivated plums on plum roots are free from nematode. The Marianna plum stock is noted as resistant.—*T. H. McHatton.*

9196. Maier-Bode, Friedrich Wilhelm. **Taschenbuch der tierischen Schädlinge in Feld, Garten, Speicher, Haus, im Obstbau und im Weinberg. [Handbook of animal pests of field, garden, granary, house, orchard and vineyard.]** *163 p. 38 pl. (30 colored), 14 fig.* J. F. Schreiber: Esslingen and Munich, [1924.]

9197. Ong, E. R. de. **The relation between the volatility and toxicity of nicotine in sprays and dusts.** Jour. Econ. Entomol. 16: 486–493. *Fig. 5.* 1923.—Free nitocine is very volatile, while nicotine sulphate is non-volatile. The toxicity of nicotine solutions varies in proportion to their conversion from the salt form to the free alkaloid. The volatilization curve of nicotine is almost an exact parallel to the curve of toxicity both of fumigation and spraying. Dust carriers follow the same law, namely, an inert material does not free the nicotine as does an active carrier and, hence, is less efficient.—*Author's abstract.*

9198. Richardson, Charles H., and C. R. Smith. **Studies on contact insecticides.** U. S. Dept. Agric. Dept. Bull. 1160. *1–15.* 1923.—This is a laboratory study of the effect of certain organic compounds, as contact insecticides for *Aphis rumicis* L., on nasturtium plants (*Tropaeolum majus*). Pyridine, alpha picoline and commercial pyridine (which contained the higher homologues of pyridine) were of little value. With the exception of nicotine the alkaloids tested possessed little toxicity. Nicotine and a crude pyrethrum preparation were the most toxic substances examined. The aliphatic amines and substituted ammonium compounds showed considerable toxicity. Tetramethylammonium chloride was the most toxic, methylamine hydrochloride the least. Of the cyclic amines, benzylamine was more toxic than aniline. Aliphatic alcohols and ketones had little effect on the aphids, but benzaldehyde was moderately toxic. Of the phenols, cresol U. S. P. had the greatest effect and pyrogallol the least, while phenol and resorcinol occupied an intermediate position. The esters of cyclic compounds were somewhat toxic. Sulphonic acids and their salts were relatively non-toxic. Picric acid and Na salicylate were appreciably toxic. Benzene, toluene, and xylene were but slightly toxic. Aliphatic compounds containing Cl were of low toxicity, while benzene derivatives containing Cl had much greater action. Essential and fixed oils showed some toxicity. Piperidine as the sulphate and trimethylene as the hydrochloride, when applied in dilute soap solution, were more toxic than the respective free bases. Nicotine and nicotine sulphate under the same conditions were of approximately equal toxicity. The following compounds were relatively non-toxic to the nasturtium plant: Pyridine and its homologues, alkaloids, Na phenolsulphonate, aliphatic aldehydes and ketones, and alcohols of low molecular weight. Most of the other compounds used had considerable toxicity when applied to the external surfaces of the plant. Volatility and the boiling point are not reliable indices of the toxicity of organic compounds when used as contact insecticides. Chemical structure is not a dependable index of toxicity, but is probably the best empirical guide at present available for the study of contact insecticides.—*Chas. H. Richardson.*

9199. Snapp, Oliver I. **Three years of Paradichlorobenzene experiments in the South.** Jour. Econ. Entomol. 17: 253–259. 1924.

9200. Snapp, Oliver I., and C. H. Alden. **Dusting and spraying peach trees after harvest for control of the plum curculio.** U. S. Dept. Agric. Bull. 1205. *1–18. Pl. 1–2, fig. 1–4.* 1924. —Post-harvest spraying and dusting decreased the number of beetles per plat. Details are given. The chief benefit from this work, however, lies in preventing the rapid increase of second-generation adults, which are emerging in numbers at that season of the year. The untreated plats show a marked increase in second-generation adults after harvest. Mortality tests conducted in the insectary show that the dust is not effective after a period of 2 weeks. Two applications are necessary for best results in controlling the curculio after harvest—the first, 4 weeks after the harvest of the latest variety of peaches and the second, 2 weeks later. Post-harvest treatments are not advisable except in cases where the curculio infestation has been severe during the peach season. Post-harvest liquid spraying after the usual liquid spray schedule had been followed earlier in the season on the fruit resulted in severe burning of the foliage. Two post-harvest applications of a 10% arsenate of lead and 90% hydrated lime dust can be used with safety, and are recommended in cases of bad infestation with curculio. In dusting peach trees after harvest for the curculio this dust should be used at the rate of about ½ of a pound per tree. When used at that rate the dust can be applied for about ¾ of a cent per tree for each application.—*O. I. Snapp.*

9201. Turner, W. F. **Kernel spot of pecan caused by the southern green soldier bug.** Jour. Econ. Entomol. 16: 440–445. *Pl. 6.* 1923.—Kernel spot proves to be a physiological trouble, resulting from the feeding of Hemiptera, particularly *Nezara viridula* L. As a result of such feeding the tissue of the kernel breaks down for a short distance around the puncture, resulting in a hemispherical discolored portion. This becomes bitter and imparts its bitterness to the whole kernel. Only the kernel is affected and the trouble cannot be detected until the nut is cracked. The insects can cause kernel spot only during the period when the kernel is hardening. They do not breed on pecans; only the adults feed on the nuts. Cowpeas and soybeans, being important breeding hosts, should not be used as cover crops in the orchards. —*Author's abstract.*

9202. Uphof, J. C. Th. **Über die Verwendung von Krankheitserregern zur Bekämpfung schädlicher tropischer Insekten. [Use of disease causing organisms in combating harmful tropical insects.]** Tropenpflanzer 26: 4–7. *1 fig.* 1923.—The writer emphasizes the use of certain fungi which are the causes of diseases of insects. For example, *Aschersonia* spp. are found on different kinds of scale insects. Plantations which are difficultly accessible with spraying machinery can be effectively helped by the artificial distribution of pure cultures of the fungi; when once established they will soon become distributed throughout the entire field.—*J. C. Th. Uphof.*

9203. Watson, J. R. **Control of root-knot nematodes on Florida truck farms.** Jour. Econ. Entomol. 17: 225–230. 1924.—The author discusses various studies in nematode control. Starvation by means of summer fallow, keeping down old plant growth and preventing crust formation, reduced the nematodes but was very injurious to the fertility of the soil. The clean cultivation of an immune crop, like velvet bean, reduced nematodes enough to allow growing of a very susceptible crop the following season. Good results are reported in seed bed treatment with the use of sodium cyanide. Soil is first saturated with sodium cyanide solution. Ammonium sulphate is applied at the rate of about 900 pounds per acre and carried into the soil by irrigation water. Hydrocyanic acid gas is thus released in the soil. Notes as to use of other soil fumigants are given.—*A. B. Massey.*

9204. Wilson, G. Fox. **The Eelworm disease of phloxes.** Jour. Roy. Hort. Soc. 49: 203-210. *Fig. 38–45.* 1924.—The symptoms of this disease due to *Tylenchus devastatrix* Kühn and the life history of the organism are described. Varieties of phlox differ in their susceptibility. A list of varieties arranged in order of resistance is given. Experiments showed that this organism spreads very rapidly in a very damp soil but progresses with greater difficulty in light sandy soil. In order to avoid the disease, both soil and plants free from eelworms are necessary. Root cuttings do not carry eelworms so long as the roots are washed completely free from the soil surrounding them.—*J. K. Shaw.*

9205. Yothers, W. W., and Arthur C. Mason. **The camphor thrips.** U. S. Dept. Agric. Dept. Bull. 1225. *1–29. Pl. 1–6, fig. 1–7.* 1924.—This paper discusses the life history and habits of the camphor thrips (*Cryptothrips floridensis*) and gives the methods of holding it in check. The insect first appeared in Florida in 1912 as an enemy to the newly developing camphor industry of the State. When the trees are pruned back to produce wood for distillation purposes the thrips appear on the cut ends in enormous numbers, often killing them. They are also injurious to camphor trees grown for ornamental purposes. The range of the insect includes all of the southern U. S. A. where camphor trees grow. Reproduction is rapid, about 20 days being required for a generation in summer and 40 days in winter. The adult lays an average of 463 eggs and often lives for several months. The most practical method of control is a changed system of pruning the trees. Cutting the trees off at the surface of the ground rather than dehorning or cutting away part of the limbs eliminates most of the damage. This system removes all hibernating places of the insects as well as their source of food. The trees later sprout out from the crown and the new growth resulting remains free from infestation for several months. Formulae for spraying ornamental trees, treating the cut ends of pruned trees, and fumigating nursery trees are also given.—*Authors.*

INFECTIOUS CHLOROSES (MOSAIC AND PEACH YELLOWS GROUPS, ETC.)

9206. Anonymous. **Mosaic disease.** Jour. Jamaica Agric. Soc. **29**: 81. 1925.—A list of the grasses found susceptible to sugar-cane mosaic in Jamaica is given.—*John A. Stevenson.*

9207. Altson, R. A. **The spread of cane mosaic in the West Indies.** [Jour. Bd. Agric. British Guiana.] International Sugar Jour. **27**: 293. 1925.—Mosaic disease is the most serious problem with which Jamaica cane growers have to contend. In some cases 100% of the cane is infected and the spread is very rapid. Plants were grown on a virgin island in the middle of a river flowing through a mosaic-infected valley, from tops brought from a non-infected district 50 miles distant. At the time of cutting all were found to be infected with mosaic. Loss in tonnage is considerably greater from mosaic spread by planting infected tops than from the disease when spread by insects, the plants in the former case being affected from the beginning. By careful roguing, an infection of less than 5% can be controlled but not eradicated. This would require 1 man for every 20 acres. Loss from 100% infection is not less than 50%. Cane mosaic has not yet been reported from British Guiana.—*Nellie E. Fealy.*

9208. Chardon, Carlos E. **Experimentos sobre matizado en la Central Cambalache. [Experiments with mosaic at Central Cambalache.]** Rev. Agric. Puerto Rico **13**: 205–218. *10 fig.* 1924.—The 2 cane varieties, B. H. 10–12 and S. C. 12–4, are being planted extensively on the north coast of Porto Rico and are giving high yields. Mosaic disease attacks both varieties and, while neither has as yet shown signs of injury, there is the possibility that they will break down suddenly. As a precautionary measure a large series of other varieties are being tried out in the Royal lands near the coast where mosaic disease is not prevalent.—*John A. Stevenson.*

9209. Chardon, Carlos E. **La relacion de ciertas yerbas con el matizado de la caña de azucar. [The relation of certain grasses to sugar-cane mosaic.]** Rev. Agric. Puerto Rico **12**: 305–314. *5 fig., 1 chart.* 1924.—Studies were made to ascertain which of the weed grasses occurring in cane fields were hosts of *Aphis maydis*, the aphid known to be a carrier of the virus of sugar-cane mosaic. Four species were found to be the favorite host plants, *Eriochloa subglabra, Echinochloa colona, Eleusine indica* and *Syntherisma digitata.* Based on this information a field experiment was then carried out to ascertain the effect of frequent weeding on prevalence of mosaic. A plot of 1 acre was planted to Cavangerie cane, a susceptible variety, using infected seed in part, to make certain of sources of infection. One-half of the plat was carefully weeded every 2 weeks during the growing season, the other half twice only. In the latter half, 2.9% secondary infection occurred, as against 12.4% in the carefully weeded portion, indicating that weeding does not prevent mosaic infection.—*John A. Stevenson.*

9210. Cook, Melville T. **El dominio del matizado de la caña de azúcar. [Control of cane mosaic.]** Rev. Agric. Puerto Rico **14**: 7–9. 1925.—The author gives briefly the history of investigations on the mosaic disease of sugar cane as carried out in Porto Rico by various workers and outlines the measures which have brought the disease under control.—*John A. Stevenson.*

9211. Dodds, H. H. **South African Sugar Association Experiment Station.** South African Sugar Jour. 9: 311, 313. 1925.—In the comparative experiments at Umbogintwini with streak-diseased and healthy cane the latter shows definite superiority over the former. There is a tendency in the diseased plants to produce a larger number of shoots than the healthy planted cane, but they are of inferior size and appearance. Dusting with tobacco powder to repel the insect carriers had no appreciable effect on rate of infection, and the same is true where tobacco powder was used to reduce spread of jassid in cotton. The establishment and maintenance of nurseries for plant cane as distant from other cane as possible and roguing out streak-diseased cane would be a great advantage to planters. A series of fertilizer experiment plots on which mineral phosphate alone was used showed a decided improvement over the control plots, and still better results were shown on plots on which the same quantity of phosphorus in soluble form was used. The section fertilized with rock phosphate without nitrogen showed slight superiority over the control section, while the section fertilized with rock phosphate and nitrogen in organic form showed a somewhat larger leaf development. The soil was not deficient in potash or nitrogen in available form, but was very low in phosphate. Another series of similar experiments showed a marked difference in favor of all the fertilized plats. In a series of experiments with potash fertilizers the potash had a very evident effect on the relatively potash-deficient red clay soil. Sections treated with mineral phosphate only showed an advantage over the controls, but the superiority is much more marked where potash also is supplied. The sections treated with potassium chloride and mineral phosphate showed best results.—*Nellie E. Fealy.*

9212. East, Edward M., and William H. Weston. **A report on the sugar cane mosaic situation in February, 1924, at Soledad, Cuba.** Contribut. Harvard Inst. Trop. Biol. and Med. 1. *1-52. Pl. 1-9.* Harvard Univ. Press: Cambridge, 1925.—"In this new series . . . . it is planned to publish such reports as may, from time to time, be offered as a result of the activities of the various contacts which Harvard University has established with the Tropics, in the broad fields of biology and medicine. . . . . The first paper to appear . . . . as it summarizes the best contributions of those who have studied the [sugar cane mosaic] disease" is believed to be of real interest and value.—The authors conclude that the disease at Soledad is the well known sugar cane mosaic, and it seems probable from its history elsewhere that the malady is generally distributed, though unreported, in all parts of Cuba. Environmental conditions affect the visible symptoms of mosaic. Field records, Grey's experiments and cases observed at Soledad seem to show that many, sometimes a majority, of the shoots from an infected plant may throw off all symptoms of the disease after the stool has given definite evidence of infection.—At Soledad there seemed to be no evidence of lessening of tonnage, yield of juice, sugar content or purity, from the disease. In its relation to mosaic, sugar cane as compared to tobacco is a resistant plant.—The authors give recommendations for Soledad, for future investigations in the field, and for studies of the histology, physiology and mode of transmission of the disease. The different types of chlorosis are then discussed, and finally the mosaic situation at Soledad is detailed, including distribution, quantity, relation to external conditions, injuriousness and potentialities.—A bibliography of 128 titles is appended.—*Frederick V. Rand.*

9213. Folsom, Donald, and E. S. Schultz. **Methods to be observed to prevent spread of virus diseases in potatoes grown for seed stock.** Proc. 11th Ann. Meeting Potato Assoc. America **1924**: 20-26. 1925.—The authors state that "in one variety, in one field or plot, in one season, we can and do show ten distinct virus or degeneration diseases. These varieties do not behave alike in the one variety in regard to perpetuation and spread. Further, each disease may vary with the potato variety infected, and each disease may, in one variety, vary in symptoms from one region to another or from one season to another." The question of spread of disease then is discussed with respect to its spread from region to region, from farm to farm, from field to field, from plant to plant, and from one part of a tuber to another. Advance testing of seed stock from one region intended for planting in another is regarded as a fairly efficient and reliable method for determining the desirability of any given seed stock. Personal inspection of growing seed stock is suggested as a means of avoiding spread of disease from one farm to another. From data at hand the authors believe that field to field spread is less than that from hill to hill. Spread of disease from one plant to another can be greatly lessened by careful roguing. The incomplete infection of individual buds on a given tuber is frequently responsible for failure of observer in tuber-indexing to eliminate the virus diseases. In summing up their conclusions the authors state that the methods to be observed to prevent spread of virus diseases in potatoes grown for seed stock depend largely upon the region, variety, and disease concerned.—*W. Stuart.*

9214. Gilbert, A. H. **Studies on spindle-tuber of the potato.** Proc. 11th Ann. Meeting Potato Assoc. America **1924**: 101–102. 1925.—This paper is based on field observations throughout Vermont and on cultural studies at the Vermont Agric. Exp. Sta., Burlington, Vermont. A comparatively small percentage of spindle tuber having the vine characters and tuber shapes described by Schultz and Folsom were noted. In certain strains of the Green Mountain variety in Vermont there appears to be an increasing percentage of plants affected with another type of degeneracy having vine and tuber symptoms similar but not identical with those described for spindle tuber. Symptoms which are in accord are those of upright habit of growth with marginal rolling and rugosity of leaves. Frequently the leaves are wavy margined. Characteristics which are at variance are an upright but often widely spreading vine with rough and margined stems, distinctly coarser than the normal healthy vine of the variety, and also later in maturing.—*W. Stuart.*

9215. Goss, R. W., and George L. Peltier. **Further studies on the effect of environment on potato degeneration diseases.** Nebraska Agric. Exp. Sta. Res. Bull. 29. *1–32. Pl. 7.* 1925.—The effect of environmental factors, including light, temperature, and soil moisture, upon the degeneration diseases of the potato has been studied for the purpose of determining the limiting factor or factors in the masking of the symptoms. The diseases under observation included various mosaics, spindle-tuber, and yellow dwarf. The authors conclude that of the environmental factors studied, light, soil moisture, and soil temperature have very little or no effect upon the foliage symptoms of any of the degeneration diseases studied. High soil moistures and high soil temperatures appear to increase the severity of the tuber symptoms of the spindle-tuber disease. However, high soil temperatures also have a tendency to change the shape and color of the tubers of plants not affected with spindle-tuber. The effects of air temperature on the foliage symptoms of the degeneration diseases were found to be very pronounced and it appears to be the most important factor studied in the inhibition or masking of the foliage symptoms. In addition to the masking of mottling, wrinkling, ruffling, rugosity, curling, rolling, and brittleness in mosaic plants, it was found that spotting, streaking, burning, and leaf-dropping on Bliss Triumph plants affected with rugose mosaic were eliminated at a temperature of 25°C. The symptoms of the various mosaic diseases were more pronounced on the Green Mountain variety than on Bliss Triumph and the masking effect at high temperatures was not as great. Masking of symptoms was greatest at high temperatures with mild mosaic, while spindle-tuber symptoms were masked at low temperatures. When mosaic and spindle-tuber occurred on the same plant, the severity of the mosaic symptoms decreased, while those of spindle-tuber increased, at high temperatures. As a rule the masking of symptoms was not as marked at high temperatures with combinations of degeneration diseases as with a single mosaic. The several and distinct diseases described by Schultz and Folsom were found to come true to type by tuber perpetuation when the possibility of infection with other diseases the previous year had been eliminated. The addition of new disease symptoms occurred when the plants were grown in the field subject to infection by insect transmission. *Yellow dwarf* appeared as a disease distinct from the others studied. The temperature effect was the reverse of that occurring with mosaic. At 25°C. the disease was very severe, while at 15°C. no symptoms appeared. The application of these results to field and experimental work with these diseases is discussed.—*T. A. Kiesselbach.*

9216. Gravier, Gabriel. **Conferencia pronunciada por el Dr. Carlos E. Chardon, Comisionado de Agricultura y Trabajo de Puerto Rico, en la estacion experimental agronomica, sobre la enfermedad del "mosaico" o "matizado" de la caña de azúcar. [Conference on sugar-cane**

mosaic.] Rev. Agric. Puerto Rico 14: 188–197. *2 fig.* 1925.—This is a report of a conference on the mosaic disease of sugar cane between Carlos E. Chardon, Commissioner of Agriculture and Labor of Porto Rico and members of the staff of the Cuban Exp. Sta. at Santiago de las Vegas, Cuba. The status of the disease in Porto Rico is given.—*John A. Stevenson.*

9217. McKinney, H. H. **Certain aspects of the virus diseases.** Phytopathology 15: 189–202. 1925.—This paper is largely a discussion of previous work reported by various students of the virus diseases of plants and animals, with special regard to the cell inclusions found associated with certain of these diseases. The nature of these cell inclusions and their probable relation to the diseases are discussed. From a study of the various methods and techniques employed the author concludes that no one method gives promise of definitely proving the nature and cause of these diseases, and expresses the opinion that a combination of cross inoculations and a study of cell inclusions may show valuable results with mosaic of plants. Successful cross inoculations have been reported between hosts in which the cell inclusions show distinct morphological characteristics. Exact study of the relation of various environmental factors to the development of mosaic diseases may also throw light on their nature and cause.—*B. B. Higgins.*

9218. Martin, Wm. H. **Spindle tuber—a disease of potatoes.** New Jersey Agric. Exp. Sta. Ann. Rept. 44: 345–347. 1923 [1924].—This trouble was first observed in the fall of 1921 on late planted Irish Cobblers grown from northern seed. The vines of affected plants grow upright, branch but little and are smaller than normal; the leaves are smaller than normal, pointed and with a tendency to roll. Infected tubers are long, smooth skinned and show more eyes than normal tubers. Tubers from healthy and diseased plants in the same field were selected in the fall of 1921 and planted in 1922. The results of this test showed that the yield from the healthy tubers was 84.6% greater than from the diseased. The ratio of length to width for the healthy tubers was 1.08 in the fall of 1921 and 1.12 in the 1922 crop; for the diseased tubers the ratios were 1.41 and 1.40, respectively. The latter showed 13.9 eyes per tuber as compared with 10.3 for the healthy tubers.—*Author.*

9219. Menéndez Ramos, R. **El suelo no puede ser responsable del matizado de la caña. [The soil is not responsible for cane mosaic.]** Rev. Agric. Puerto Rico 11^3: 13–19. 1923.—In spite of statements to the contrary, the soil is not in any way responsible for causing the mosaic disease of sugar cane. The results obtained by various workers in Porto Rico confirm this statement. Directions for eradicating the disease are given.—*John A. Stevenson.*

9220. Menéndez Ramos, R. **Estudios sobre el mosaico de la caña. Movimiento del virus de la enfermedad a traves del tallo en el caso de infecciones secundarias. [Studies on mosaic. Movement of the virus in secondary infections.]** Rev. Agric. Puerto Rico 13: 219–226. *2 fig.* 1924.—In the case of secondary infections of sugar cane stalks with the mosaic disease, varying proportions of the stalk remain apparently normal, the upper leaves and tip of the stalk showing the typical symptoms. The question arose as to whether the entire stalk was diseased in such cases. Experiments demonstrated that such was the case.—*John A. Stevenson.*

9221. Menéndez Ramos, R. **Sigamos con al matizado. [Further notes on mosaic.]** Rev. Agric. Puerto Rico 11^5: 23–28. 1923.—Further evidence is presented to show that the soil does not harbor the mosaic disease of sugar cane.—*John A. Stevenson.*

9222. Mulvania, Maurice. **Cultivation of the virus of tobacco mosaic by the method of Olitsky.** Science 62: 37. 1925.—A repetition of the experiments reported by Olitsky [Science 60: 593–594, 1924 (see Bot. Absts. 14, Entry 5674); Jour. Exp. Med. 61: 129–136, 1925] gave results that did not confirm the findings of Olitsky. The series of dilutions of the virus showed a decreasing number of infections for the more dilute transfers and thus failed to show a growth of the causal organism in the "culture" medium.—*C. J. Lyon.*

9223. Olitsky, Peter K., and John H. Northrop. **The inoculation of tomato and tobacco plants with potato mosaic virus.** Science 61: 544–545. 1925.—The leaves of normal tobacco plants (*Nicotiana affinis*) were rubbed with mosaic potato tubers and with leaves of potato showing the disease. A high percentage of infection was obtained. A few infections of tobacco seedlings were obtained by treatment with apparently normal potato tubers as reported by Johnson. The appearance of the disease in the 2 forms is identical and is the same for the experimental disease as with the natural infection.—*C. J. Lyon.*

9224. Perret, Cl. **Les maladies de la pomme de terre en 1924. [Diseases of Irish potato.]** Rev. Path. Vég. et Entomol. Agric. **11**: 309–316. 1924.—The proportion of plants affected by degeneration diseases in the progeny of potato tubers selected from healthy appearing plants in the cultures of the previous year depends: (1) on the proximity of the parent plants to neighboring degenerated potato plants (the better the isolation, the less serious the contamination), (2) on climatic conditions (a distance of 2 m. between hills affords a good isolation in normal years, but only a poor isolation when the summer is very hot), and (3) on the variety concerned.—*J. Dufrenoy.*

9225. Rawlins, T. E., and James Johnson. **Cytological studies of the mozaic disease of tobacco.** Amer. Jour. Bot. **12**: 19–32. *1 pl.* 1925.—In the chlorotic tissues of mozaic tobacco leaves were found (1) spherical, ovoid or crescent-shaped vacuolate bodies; (2) masses of a striate, secretion-like substance; and (3) various smaller, dark-staining bodies. The occurrence and character of these bodies in the leaves of plants grown at 18, 28 and 34°C. are described. It is not easy to determine the cycle of development of these bodies since a cell may contain either a large number of small bodies or 1 or 2 of the larger, vacuolate ones at either an early or a later stage in the development of the disease. The fact that the striate material is usually in contact with the nucleus during its early stages indicates that it may bear a close relation to the nucleus. Its amorphous nature suggests that it may be a product of the diseased cell or of the causal agent. All the types of bodies have been found in leaf cells containing mitotic figures.—*E. W. Sinnott.*

9226. Redpath, W. H. **A planter's experience with mosaic disease and the planting of Uba cane.** Jour. Jamaica Agric. Soc. **29**: 18–21. 1925.—The various factors such as very wet or dry weather and other unfavorable growth conditions favor increase in the amount of mosaic present. Good cultivation, roguing out of infected plants and the use of resistant varieties, Uba in particular, give satisfactory control. Maize, which is very susceptible to mosaic, should not be grown in or adjacent to cane fields.—*John A. Stevenson.*

9227. Rosenfeld, A. H. **Aspecto beneficioso del matizado de la caña de azúcar. Reflexiones historicas y una profecia. [Beneficial aspects of sugar-cane mosaic.]** Rev. Agric. Puerto Rico **12**: 7–16. 1924.—Just as the boll weevil forced diversification of crops in the Southern States (U. S. A.) and thus proved in a measure beneficial, so has the mosaic disease situation in Porto Rico a bright side, in that cane growers have been compelled to improve their cultural conditions and employ new varieties with the result that much larger yields are now obtained than in the past. The author predicts that a similar state of affairs will be brought about in Cuba where the mosaic disease has only recently begun to attract attention, although it is already widespread over the Island.—*John A. Stevenson.*

9228. Schultz, E. S., and Donald Folsom. **Infection and dissemination experiments with degeneration diseases of potatoes. Observations in 1923.** Jour. Agric. Res. **30**: 493–528. *Pl. 1–10, fig. 1.* 1925.—Eight degeneration diseases are described as observed in the Green Mountain variety, namely, mild mosaic, leafrolling mosaic, rugose mosaic, crinkle mosaic, streak, leaf-roll, spindle tuber, and unmottled curly dwarf. Occasional new symptoms are the spindling sprouts of leaf-roll, the corolla necrosis of streak, and the tuber cracking of unmottled curly dwarf in the season of inoculation. Rurals and Irish Cobblers suppress the mottling of mosaic. Of the 8 diseases, only leaf-roll was not transmitted by leaf-mutilation inoculation. Leaf-mutilation inoculations with mild mosaic and spindle tuber are more effective with repetition. Inoculation with a combination of diseases represented in the inoculum sometimes results in the infection of some of the inoculated plants by one disease alone, and of others by another disease alone. Judging from current-season symptoms, rugose mosaic is progressively less infectious in inoculum from the leaflets, the entire shoots, the stems and petioles together, the seed tubers, and the roots. The period between inoculation and the appearance of current-season symptoms is progressively longer for rugose mosaic, leafrolling mosaic, and mild mosaic. Following inoculation in the field, mild mosaic spreads naturally from newly infected plants more than other kinds of mosaic. Natural spread of rugose mosaic and leafrolling mosaic is sometimes manifested by current-season symptoms. Mild mosaic observed in at least 8 consecutive generations of a Green Mountain strain was still distinct from the other types of mosaic. Insect cages with openings in the top are described. Using diseased and healthy lots with different tuber color respectively, the dissemination of mosaic in the absence of aphids was proved. A 3rd species of aphids, the "buckthorn aphid" (*Aphis abbreviata* Patch), that feeds on potatoes was shown to transmit mild mosaic. True seed from mosaic plants produced healthy seedlings. Mild mosaic mottling is suppressed in the South, while further south there is greater spread of mild mosaic, rugose mosaic, leaf-roll, and spindle tuber. (See also Bot. Absts. 13, Entry 5296.)—*Donald Folsom.*

9229. Storey, H. H. **Diseases of the sugar cane type. South Africa. Part 1. True mosaic, mottling or yellow stripe disease.** Jour. Dept. Agric. Union of South Africa **9**: 108–117. *Pl. 1–11, 1 fig.* 1924.—Mosaic was found by the author on his arrival in Natal in 1922, though no previous record of the disease in that area exists. The leaf markings on many varieties are the only distinctive symptoms shown by an affected plant, but in others the disease may also produce characteristic markings on the stalk. Cankers may also appear later in pale areas, due to the death of the underlying tissue and resembling the injury produced by long exposure to sunlight. The most severely damaged are the thick tropical canes which are not grown to a large extent. The best known of these are Lonzier and its sport (Horne), Port Mackay and Green Natal or Rose Bamboo. Natal Uba and those of a similar type are completely immune. "Tolerant" types which, while readily contracting the disease, do not suffer ill effects are the Argentine cane (seedlings produced in Java of Chunnee-cheribon parentage) and Agone, a North-Indian cane indistinguishable from Uba except by this character. By means of maize aphids the disease has been transferred to maize and to a common weed grass, *Digitaria horizontalis* Willd. Similar symptoms have been observed in the following other grasses growing in close proximity to diseased sugar-cane; *Urochloa helopus* Stapf, *Panicum longijubatum* Stapf, *Setaria verticillata* Beauv., and *Eragrostis ciliaris* Link. Kaffir corn (*Sorghum*) is not affected. The disease is spread by means of the common green-mealie aphis, *Aphis maidis* (*A. adusta* Zehntner), though the common yellow sugar cane aphis, *A. sacchari*, is incapable of effecting a transfer of the disease. The control method recommended for this disease, which in the opinion of the author was introduced from the Argentine in 1914 in an importation of the tolerant Java seedling canes, is the complete eradication of all varieties of sugar cane except Uba. From the viewpoint of disease control in South Africa, the position is favorable, since over 99.8% of the cane area is planted to the immune Uba.—*L. I. Goldblatt.*

9230. Vélez, Ramón. **El mosaico del tabaco. [Tobacco mosaic.]** Rev. Agric. Puerto Rico **10**^{2}: 25–26. 1923.—This article gives a brief description of the disease, with recommendations for control.—*John A. Stevenson.*

9231. Werner, H. O. **Relation of environment to spindle-tuber symptoms.** Proc. 11th Ann. Meeting Potato Assoc. America **1924**: 102–106. 1925.—Recently completed experiments at the Nebraska Agric. Exp. Sta. (see this issue, Entry 9215) have contributed some facts concerning the effect of environmental conditions upon tuber symptoms which are now of great practical value in connection with seed potato inspection and certification, particularly with respect to spindle-tuber symptoms. Soil condition such as texture, moisture, and temperature exerts a marked influence upon tuber symptoms, but relatively little upon stem and foliage characters. The studies of soil texture showed that the better shaped tubers were produced on the lighter soils. The progeny of spindle tubers grown in the sandiest soil were of better type than those from normal tubers produced on heavier soils. In the case of soil moisture the tubers grown in the low moisture soil were more elongated than those receiving the optimum amount of moisture. Very excellent type tubers were produced at 56°F. by both normal and spindle-tuber seed stock. At 69.4 or 71.5°F. spindle tuber stock was considerably elongated. In 1923 and 1924, halved Nebraska grown spindle-tuber Triumphs were grown at Presque Isle, Maine, and Scottsbluff, Nebraska. Those grown in Maine were much less elongated than those grown in Nebraska. Early planting in western Nebraska tends to increase elongation of spindle-tuber stock.—*W. Stuart.*

9232. Werner, H. O. **The spindle-tuber disease.** Nebraska Agric. Exp. Sta. Bull. 207. *1–21. Fig. 13.* 1925.—This is in large part an abridged edition of Nebraska Agric. Exp. Sta. Res. Bull. 24 and 32. It is concluded by the author that the spindle-tuber disease is one of the most prevalent potato diseases occurring in all parts of Nebraska. It has been found in all varieties tested. Much damage is done to the potato crop, in that the yield and market quality are reduced. In the advanced stage it causes the development of elongated, cylindrical-shaped tubers with a large number of weak, shallow, or bulging eyes. The disease is carried over in the seed tubers. It is of an infectious nature and is transmitted from diseased to healthy plants by insects. Under certain conditions it spreads very rapidly and is capable of ruining a lot of seed for commercial production in 1–3 years. The disease seems to spread more rapidly in irrigated than in dry land fields. In eastern Nebraska it seems to develop less extensively in straw-mulched than in cultivated potatoes. Recommendations for the control of the disease are: (a) Selection of a good strain of seed potatoes as free as possible from this and other diseases; (b) selection of the best type tubers for planting in a seed plat; (c) isolating this seed plat from all other potato fields by a distance of at least 300 feet; (d) roguing this plat severely, early, and frequently, removing all suspicious-looking plants; and (e) selection of tubers of best type produced in this plat for use in the seed plat the following year and using the remainder of the potatoes for the commercial planting.—*T. A. Kiesselbach.*

9233. Wuthrich, E. **Yellow stripe disease in Natal.** South African Sugar Jour. **9:** 181, 183. 1925.—In 1918 the author observed a disease which he called yellow stripe, and if it is assumed that this trouble was identical with what is now known as streak disease he was the first to call attention to its seriousness. In order to prevent its spread and the resulting degeneration of cane, the author recommends the selection and cultivation of plant cane on central nursery farms and distribution from these farms to growers. Yellow stripe is described as a disease of the leaves and affects the cane as well as sugar production.—*Nellie E. Fealy.*

PARASITIC PHANERGAMS

9234. Palm, B. T., and C. Heusser. **Striga lutea als Schädiger des Reises auf Sumatra. [S. lutea injuring rice in Sumatra.]** Zeitschr. Pflanzenkrankh. **34:** 11–18. *4 fig.* 1924.—*Striga lutea* is a semi parasite belonging to the family of Scrophulariaceae. In Sumatra this plant flowers and seeds throughout the year. It is a weed very destructive to rice. Rice fields in which it occurs have a brown-red, scorched appearance, as if suffering from drouth. The seed may rest for years in the soil. Weeding is quite successful.—*H. T. Güssow.*

9235. Perry, Walter J. **Can mistletoe be eradicated by pruning?** Jour. Forest. **20:** 627–628. 1922.—Apparently the only way to rid an area of mistletoe (*Razoumofskya robusta*) on (western) yellow pine is to prune selected saplings—potential seed trees—twice, with 2 years between prunings, and at the same time to fell all other infected trees.—*Philip C. Wakeley.*

NON-PARASITIC DISEASES

9236. Anonymous. **Injury to plants in the garden by frost on March 27.** Missouri Bot. Gard. Bull. 9. *66–68.* 1921.

9237. Farley, Arthur J. **Spray injury to peaches.** Amer. Fruit Grower **45^6:** 12, 15. 1925.—Spray injury to peaches is discussed with reference to the different forms of injury and the conclusions as to the cause of this injury. Four forms of spray injury are described, namely, leaf injury generally followed by defoliation, cankering of the 1-year old wood, cankering of the new growth, and injury to the fruit. On the basis of present information drawn both from experimental data and general observations, it is stated that (1) lead arsenate alone, or in combination with lime, should never be applied to peach trees during the growing season; (2) powdered lead arsenate at the rate of 1 pound to 50 gallons of standard dry mix is the maximum amount that is safe to use on peaches during the growing season; (3) fresh hydrated lime containing not less than 90% calcium oxide should be used in preparing dry mix; and that (4) great care should be exercised in weighing or measuring all ingredients before they are put into the spray tank.—*Arthur S. Rhoads.*

9238. Gard, M. **Etat actuel des noyers ayant subi le gel de novembre 1921. [Effects of the low temperatures November, 1921, on Juglans.]** Rev. Path. Vég. et Entomol. Agric. **11:** 243–245. 1924.

9239. Haenseler, C. M., and Wm. H. Martin. **Arsenical injury to peach.** Phytopathology **15**: 321–331. *Fig. 1–4.* 1925.—Spray injury to peach trees has been very prevalent in New Jersey during the past 3 years. The injury became evident as a spotting or yellowing and premature drop of the leaves, as gumming cankers at the nodes of the new growth and of the 1 year-old wood, and occasionally as a spotting and drop of the immature fruits. In spray tests extending over 3 years, atomic sulphur, flowers of sulphur, or lime alone caused no injury. Arsenate of lead, 1½ pounds to 50 gallons of water, used alone or in combination with sulphur or lime, or combined with dry-mix lime-sulphur, 8–4–½–50 with 1½ pounds of arsenate of lead, caused severe injury; when combined with properly made self-boiled lime-sulphur no injury resulted. Weak trees were more susceptible to injury than vigorous ones.—*B. B. Higgins.*

9240. Hardenburg, E. V. **Hollow heart in potatoes.** Potato News Bull. 2: 155–159. 1925.—The observations of the writer and the opinions of a number of potato specialists are cited in regard to the factors causing hollow heart. This condition was particularly prevalent in the crop of 1924. The consensus of opinion is that hollow heart accompanies the production of oversized tubers which usually are present in abnormally large acre yields. Heavy soils, excessive fertilization, or irrigation, and the use of certain varieties are also believed to influence its development.—*F. Weiss.*

9241. Higgins, B. B. **Blossom-end rot of pepper (Capsicum annuum L.).** Phytopathology **15**: 223–229. *Fig. 1–5.* 1925.—A physiological spotting of the blossom end of half grown pepper fruits is described and is said to be very common under certain field and weather conditions. On young, poorly rooted plants the fruits are severely injured when dry weather follows a period of damp weather and rapid, succulent growth. The disease has repeatedly been produced artificially by withholding water from potted plants after a period of rapid growth. Apparently water is withdrawn from the fruits whenever there is slight wilting of the leaves, causing a collapse of the large parenchyma cells that surround the ends of vascular bundles. The spots are small and do little direct damage, but allow infection and decay of the fruits by organisms that are unable to attack sound fruits.—*B. B. Higgins.*

9242. Jivanna Rao, P. S. **The cause of spike disease in sandal (Santalum album, L.).** (Abstract.) Proc. 11th Indian Sci. Congress, Bangalore, **1924**: 149. 1924.—Continuing his previous work [see Bot. Absts. 7, Entry 1165; 10, Entry 1872] the author states that spike is a physiological phenomenon not caused by parasitic organisms or virus. The infectious and physiological theories are discussed and evidence is given to show that sandal is an obligatory parasite. The virus theory in relation to the disease is examined and criticized and it is concluded that as the actual spike condition is attained by a process of starch accumulation which may be induced experimentally by cutting off the roots and water supply, it in nature arises when the hosts are shorter lived than sandal, or, being otherwise unfavorable, fail to supply nourishment.—*Author.*

9243. Limbourn, E. J. **The withering of wheat varieties.** Jour. Dept. Agric. Western Australia 2nd Ser. **1**: 533–534. *1 fig.* 1924.—It is pointed out that this abnormality is not due to frost, as is often supposed, but is probably due to lack of moisture. It is suggested that the adoption of early varieties would avoid the trouble.—*P. J. Olson.*

9244. McLean, Forman T., and Basil E. Gilbert. **Manganese as a cure for a chlorosis of spinach.** Science **61**: 636–637. 1925.—The correction of chlorosis and arrested growth in spinach was effected by the use of dilute solutions of manganous sulphate, applied as a spray to the rows. A solution of sulphuric acid failed to give improvement and the results were therefore attributed to the manganese.—*C. J. Lyon.*

9245. Oheimb, von, T. J. Herm, Josef Hempelmann, von Bellegarde, and others. **Ursachen und Wirkungen des Schneebruchs im Herbst 1919. [Snow damage in the autumn of 1919.]** Mitteil. Deutsch. Dendrol. Ges. **29**: 309–315. *1 pl., 8 fig.* 1920.—Various authors give short contributions on the damage caused by snow. An early snowstorm came in October and November, 1919, and many trees and shrubs suffered from the heavy weight of snow, as the plants had not yet lost their foliage. The leaves of a hedge of *Carpinus Betulus* soon became reddish and after 8–10 days they were entirely reddened. Twigs of *Acer*, *Quercus*, *Tilia* and *Aesculus* were easily broken off on account of the heavy weight of snow on the leaves. Neither conifers nor red beeches were affected. In various places a large number of trees were recorded as damaged.—*J. C. Th. Uphof.*

9246. Stone, R. E. **Winter blight or streak of tomatoes.** (Abstract.) Phytopathology **15:** 300. 1925.

9247. Tubeuf, von. [Rev. of: Appel, O., Paul Graebner, und L. Reh. **[Sorauer's] Handbuch der Pflanzenkrankheiten. (Handbook of plant diseases.) Bd. I. Die nichtparasitären Krankheiten. (The non-parasitic diseases.)** (Graebner.) *5th ed. 997 p. 271 fig.* Paul Parey: Berlin, 1924 (see Bot. Absts. 14, Entry 3734).] Forstwiss Centralbl. **47:** 206–208. 1925.—The reviewer notes several omissions in the case of some tree diseases.—*W. N. Sparhawk.*

9248. Wieler. [Rev. of: Stoklasa, J. **Die Beschädigungen der Vegetation durch Rauchgase und Fabrikexhalationen. (The injurious effects on vegetation of smoke gases and factory exhalations.)** *487 p.* Urban and Schwartzenberg: Berlin, Vienna, 1923.] Zeitschr. Forst- u. Jagdw. **55:** 667–669. 1923.—A comprehensive monograph dealing particularly with the injurious effects of sulphuric acid. Injury to vegetation is more serious in the coal districts of Czecho-Slovakia than in the Ruhr district, either because of higher sulphur content or because of the presence of selenium which is especially toxic. Radioactive plants are less liable to sulphur and selenium injury than those not so active. Plants suffer less on volcanic than on sedimentary soils, because they are richer in radioactivity. Stoklasa's discussion of the effect of sulphur dioxide on photosynthetic assimilation, etc., is theoretic. The discussion of the injurious effect of smoke upon the chemical and physical composition of the soil is, however, very instructive. For one thing, the micro-flora is considerably reduced on soils in contact with smoke fumes, and the reaction of sulphuric acid with the mineral elements in the soil cuts down the supply of available plant foods. The resistance of soils of lesser air capacity against smoke damage is less than that of normal soils and the vegetation perishes more quickly upon the former. In considering the damage caused by H_2SO_4 both the reaction of the gas upon the foliage and its reaction with the soil must be considered.—*J. Roeser.*

DISEASES OF UNKNOWN CAUSE

9249. Firor, J. William. **Pecan rosette.** Georgia State Coll. Agric. Bull. 258. *1–12. 4 fig.* 1922.—The cause of pecan rosette is unknown. Experiments conducted through a number of years on a large orchard near Louisville, Georgia, demonstrated that trees mulched with straw and in soil in which there was plenty of organic matter overcame the rosetted condition. The damage from rosette lies in the reduction of the crop in direct proportion to the number of twigs attacked. There follows a disfigurement of the tree making it look ragged and unkempt. The trees become so weakened that they are easily killed by other conditions.—*T. H. McHatton.*

9250. Kern, Frank D., and H. H. Whetzel. **Observaciones en les enfermedades del cafeto y de los arboles de sombra. [Observations on diseases of coffee and shade trees.]** Rev. Agric. Puerto Rico **13:** 7–11. *2 pl.* 1924.—Brief notes are given on coffee root disease and a disease of one of the coffee shade trees (*Inga*) due to an unknown cause.—*John A. Stevenson.*

9251. McKinney, Harold H., and Walter H. Larrimer. **Symptoms of wheat rosette compared with those produced by certain insects.** U. S. Dept. Agric. Bull. 1137. *1–8. Pl. 1–4.* 1923.—The insect injuries caused by Hessian fly (*Phytophaga destructor* Say), the wheat strawworm (*Harmolita grandis* Riley) and the wheat stem maggot (*Meromyza americana* Fitch) may cause the winter wheat plant to develop symptoms which, under certain conditions resemble those produced by the rosette disease. However, these insect injuries usually can be diagnosed with certainty by the presence of some stage of the insect on the affected plants and the seasonal period of occurrence. In the late stages of these disorders it is sometimes difficult to find any trace of the insect and in such cases the infested fields and affected plants are difficult or impossible to distinguish from fields and plants affected by the rosette disease. Rosette can be diagnosed with certainty in the early spring period before the spring infestations of the insects occur. Experimental data and observations indicate that the rosette disease is not caused by Hessian fly or the other insects mentioned.—*Harold H. McKinney.*

9252. McKinney, H. H., R. W. Webb, and G. H. Dungan. **Wheat rosette and its control.** Illinois Agric. Exp. Sta. Bull. 264. *275–296. Pl. 1, fig. 1–8.* 1925.—Wheat rosette is a disease of unknown cause occurring on a few varieties of winter wheat. Its more general external symptoms are (1) arrested spring development; (2) excessive tillering, producing a rosetted appearance; (3) dark, blue-green coloration of the fall leaves during the spring growing period; and (4) mosaic mottling on the leaves. Some investigators believe that *Helminthosporium sativum* is the causative organism, but the authors of this bulletin are of a different opinion. The disease is soil borne, and may be controlled experimentally by soil sterilization. In the field it is controlled by using resistant varieties. A list of the more susceptible and of the more resistant varieties is given.—*H. A. Lunt.*

9253. Ravaz, L., et G. Verge. **Sur une maladie de la vigne, l'excoriose. [Excoriosis, a disease of grapes.]** Compt. Rend. Acad. Sci. Paris **180**: 313–315. 1925.—In May, certain herbaceous branches of grape vines become blackened, this discoloration progressing slowly toward the base, sometimes covering the entire surface and sometimes occurring in irregular bands. The cortex remains intact, is smooth and bright and is sharply delimited from neighboring green areas. The stems become locally enlarged. At a late stage, pycnidia of *Phoma flaccida* appear. Their presence suggests this fungus as the possible cause.—*C. H. Farr.*

GENERAL AND MISCELLANEOUS PATHOLOGICAL LITERATURE

9254. Anonymous. **Some problems and exhibits in plant pathology.** Missouri Bot. Gard. Bull. **10**: 73–76. 1922.

9255. Bofill y Pichot, D. José M. **De pathologia vegetal. [Plant pathology.]** Mem. R. Acad. Cien. y Artes [Barcelona] III. **18**^{17}: 403–429. 1925.—Contains a discussion of pathology from the standpoint of both plants and animals. A discussion is also made of some of the environmental conditions which contribute to infection and subsequent development of the parasite. Examples of various methods employed in the control of plant diseases are cited. The author dwells at some length on the type of plant pathological work being done in various other countries.—*L. L. Harter.*

9256. Boyce, J. S. **Status of forest tree diseases on the Pacific Coast.** Australian Forest. Jour. **7**: 101–103. 1925.—The heaviest losses due to forest tree diseases are caused by mistletoes, wood-destroying fungi, and introduced parasites. (See also Bot. Absts. 14, Entry 5697.) —*C. F. Korstian.*

9257. Brierley, W. B. **Discussion on "The relation of plant pathology to genetics."** Rept. Internat. Bot. Conference, London, July, 1924. *P. 111–119.* 1924.—The complete understanding of a case of disease due to the action of a parasite involves the genetic and physiological analysis of both host and parasite, and the physical and chemical analysis of the conditions under which both organisms have developed and at present exist. The relation of plant pathology to genetics is an extremely complex one and care must be taken not to falsify the perspective by over simplification. The author warns also against equating the results of work with microorganisms, with the results of apparently parallel work with Primulas, fruit-flies, etc.—*Lillian C. Cash.*

9258. Cook, Melville T. **El pasado y el futuro de la patologia vegetal. [The past and future of vegetable pathology.]** Rev. Agric. Puerto Rico **11**: 33–39, 47–52. 1923.—A translation and reprint of an article originally published in the Annual Report of the Quebec Society for the Protection of Plants for 1922.—*John A. Stevenson.*

9259. Cook, Melville T. **Peligros de la importación de plantas exóticas. [The dangers of importing exotic plants.]** Rev. Agric. Puerto Rico **14**: 315–318. 1925.—The author points out the dangers of uncontrolled plant importations from the pest and disease standpoint and emphasizes the necessity for plant quarantine regulations.—*John A. Stevenson.*

9260. Cook, Melville T. **Selección de semilla de caña. [Sugar cane seed selection.]** Rev. Agric. Puerto Rico **14**: 151–153. 1925.—The author emphasizes the importance of the selection of disease-free seed to keep down losses from mosaic, gumming, root disease, dry top rot and other sugar cane diseases.—*John A. Stevenson.*

9261. Cottrell-Dormer, W. **Sugar cane diseases and pests.** Australian Sugar Jour. **17**: 41–43. 1925.—The presence of sickly yellow shoots at the base of dead cane sticks and of small dead shoots on the dead stem are generally sufficient evidence of leaf scald in Clark's Seedling in the northern cane districts. The planting of cane showing such signs means the risk of heavy losses. Among minor diseases attacking the leaf sheaths is the sclerotial disease, which causes the sheaths to stick together and to the cane stick. Symptoms are detailed. Although this disease destroys a great many young shoots its damage is seldom severe, consisting mainly in a general stunting of the affected parts, and, it is said, a lower density. The presence of the disease indicates abundant moisture and often lack of ventilation due to heavy weed growth, too close planting, etc. Where this trouble occurs stripping should be practiced; the increased tonnage usually more than pays for the work, in addition to producing healthier and more vigorous cane.—*Nellie E. Fealy.*

9262. Cottrell-Dormer, W. **Diseases and pests of sugar cane.** Australian Sugar Jour. **17:** 151, 157. 1925.—In the Herbert Rover District, Korpi and Q.813 varieties of cane have shown very little susceptibility to gumming. In Lower Burdekin, B.208 was the variety most affected by leaf stripe. Cane showing this disease should be ploughed out and more resistant varieties, such as Badila, Q.813, and M.1900 Seedling substituted.—*Nellie E. Fealy.*

9263. Cross, L. J. **A field test of mercuric chloride solutions in potato seed treatment.** Phytopathology **15:** 241–242. 1925.—A simple test is described for determining the amount of mercuric chloride actually remaining in solution during the process of potato seed treatment.—*B. B. Higgins.*

9264. Dickson, B. T. **Plant pathology in Canada.** (Abstract.) Phytopathology **15:** 300. 1925.

9265. Eyles, F. **Diseases of cotton in Southern Rhodesia. Preliminary notes.** Rhodesia Agric. Jour. **21:** 592–595. 1924.—There are over 24 parasitic diseases of the cotton plant; so far only 6 have been recorded from Southern Rhodesia. These include angular leaf spot (*Pseudomonas malvacearum*), anthracnose (*Colletotrichum gossypii*), a boll rot caused by *Bacillus gossypini*, a boll rot probably caused by some new bacterial organism; black rust (*Macrosporum nigricanthium*), and stem rot (*Cladosporium herbarum*). A popular description is given of each of these diseases and the methods of control. Mention is also made of the physiological troubles known as boll shedding and yellows.—*L. I. Goldblatt.*

9266. Eyles, F. **Some diseases of tobacco in Rhodesia. Preliminary notes.** Rhodesia Agric. Jour. **21:** 747–749. 1924.—The following diseases of tobacco, including both those of the seed bed and of the established plant, were reported from Rhodesia during the last season: *Phyllosticta nicotiana; Pyronema confluens*, the pink mold, a heavy infestation of which, it is reasonable to believe, may check some of the seedlings; *Erysiphe achoracearum* (*Oidium*), the powdery mildew; *Bacterium angulatum*, angular leaf spot; *Bacterium tabacum*, wildfire; and mosaic and etiolation due to a natural defect of the soil or a failure to distribute the fertilizer uniformly.—The means of controlling these diseases are mentioned.—*L. I. Goldblatt.*

9267. Fitch, H. W. **Quantitative determination of sulphur fungicides on foliage.** Phytopathology **15:** 351–354. 1925.—Directions for the determination are as follows: Three samples of 40 leaves each are collected and tested separately. Immerse the 40 leaves in 125 cc. of carbon tetrachloride for 3–4 minutes and stir, remove leaves, heat wash liquid slowly to boiling and filter, evaporate filtrate to 20 cc., pour into a watch glass of known weight and, after drying, determine weight of the sulphur residue. This will give comparative results. In case more exact data are required, the exposed surface of the leaves composing the sample may be measured.—*B. B. Higgins.*

9268. Gaines, E. F. **The inheritance of disease resistance in wheat and oats.** Phytopathology **15:** 342–349. 1925. (For abstract, see this issue, Entry 8749.)

9269. Glasgow, Hugh, and W. O. Gloyer. **The mercuric chloride treatment for cabbage maggot control in its relation to the development of seed-bed diseases.** Jour. Econ. Entomol. **17:** 95–101. 1924.—*Rhizoctonia* and some of the other common diseases of cabbage seed-beds are held in check by applications of mercuric-chloride solution as used in the control of the cabbage maggot, *Chortophila brassicae* Bouche. The other 2 methods in common use for maggot control (the cheesecloth screen, and applications of tobacco dust) appear to favor the development of such fungous troubles, especially during wet seasons. Applications of mercuric chloride which give the most satisfactory control of the root maggot also appear best adapted to the control of the diseases studied. One very early application followed by 1 or 2 later applications at intervals of a week or 10 days gave the best results.—*Authors' abstract.*

9270. Gross, Alfred O. **Diseases of the ruffed grouse.** Science 62: 55–57. 1925.—Those diseases reported from the study of dead birds include 2 cases of pulmonary mycosis which were due to the growth of *Aspergillus* in the lungs and air sacs. This is the 1st known record of a case in unconfined ruffed grouse. Avian tuberculosis was also determined for 3 cases, each from separate states.—*C. J. Lyon.*

9271. Hart, George M., and Jacob Traum. **The relation of the subcutaneous administration of living Bacterium abortum to the immunity and carrier problem of bovine infectious abortion.** California Agric. Exp. Sta. Tech. Paper 19: 1–50. 1925.

9272. Haskell, R. J. **Report of the sixteenth annual meeting of the American Phytopathological Society.** Phytopathology 15: 304–318. 1925.—This contains a list of the newly elected officers and representatives, reports of the Secretary-Treasurer for 1924, the Business Manager of Phytopathology, the Editor in Chief of Phytopathology, and the Advisory Board, reports of other committees, action of Council, and miscellaneous business.—*B. B. Higgins.*

9273. Herbert, F. B. **Spray stimulation.** Jour. Econ. Entomol. 17: 567–572. *Pl. 11.* 1924.—Stimulation to deciduous fruit trees has been noted from a number of different sprays, but the greatest amount has occurred after using the heavy types of miscible oils. Stimulation is due partly to the heavy oil base and partly to the emulsifiers in them. The condition of the tree and soil and time of spraying are factors in the amount of stimulation to be obtained from the oil spray. The spray must be applied between December 15 and February 1 to be certain of it. Although there may be some disadvantages, the advantages are many: (1) The early bloom makes the fruit set early, thereby coming ahead of the emergence of the thrips and insuring more and cleaner fruit; (2) the early formation of large green leaves, covering small fruit, protects it from sunburn and frost; (3) the fruit gains much of its growth before natural moisture evaporates; (4) the tree functions properly, producing larger crops and larger fruit; and (5) fruit will be harvested earlier, insuring better prices. Examples are cited and and illustrated by photographs.—*Author's abstract.*

9274. Higgins, B. B. **The diseases of pepper.** Georgia Agric. Exp. Sta. Bull. 141. *1–27. 11 fig.* 1923.—The diseases of the pepper (*Capsicum annuum* L.) have become more important with the development of the pimento canning industry in Georgia. The following conditions are discussed: Damping-off (*Rhizoctonia*), sclerotium blight (*Sclerotium rolfsii* Sacc.), Fusarium wilt (*Fusarium annuum* Leonian), mosaic diseases, bud rot (*Choanephora cucurbitarium* (Br. & Rav.) Thaxter), die back (*Vermicularia capsici* Syd.), Cercospora leaf spot (*Cercospora capsici* Heald & Wolf), bacterial spot, blossom-end rot, sunburn, anthracnose (*Gloeosporium* sp. and *Colletotrichum* sp.), Macrosporium leaf spot (*Macrosporium* sp.), Phoma rot (*Phoma destructiva*), and soft rot (*Pythium debaryanum* Hesse). The bulletin recommends seed disinfection with mercuric chloride, 1–1000. For treating dry seed, copper sulphate followed by lime is recommended. Indications are that Sclerotium blight may be reduced by applying lime to the soil.—*T. H. McHatton.*

9275. Holbert, James R., W. L. Burlison, Benjamin Koehler, C. M. Woodworth, and George H. Dungan. **Corn root, stalk, and ear rot diseases, and their control thru seed selection and breeding.** Illinois Agric. Exp. Sta. Bull. 255: 239–478. *Pl. 1–6* (colored), *fig. 1–86.* 1924.—This bulletin is a very comprehensive treatise on corn rot diseases and includes scutellum rot; Diplodia (*Diplodia zeae*); Fusarium (*Fusarium moniliforme*); black-bundle (*Cephalosporium acremonium*); ear worms (*Chloridea obsoleta*); *Aspergillis* spp., *Penicillum* spp., and other molds; bacterial wilt (*Aplanobacter stewarti*); wheat scab (*Gibberella saubinetii*); corn smut (*Ustilago zeae*); corn rust (*Puccinia sorghi*) and several others of lesser importance. The influences of environmental factors and genetic factors upon the germination, growth and yield of good and diseased seed corn are discussed. In addition, the bulletin deals with the economic importance, experimental conditions and methods, physical characters of seed ears, susceptibility and resistance, and finally, a program for corn improvement.—*H. A. Lunt.*

9276. Howitt, J. E. **Some notes on diseases new to Ontario.** (Abstract.) Phytopathology 15: 300. 1925.

9277. ILLINOIS AGRIC. EXP. STA. **Directions for spraying fruits in Illinois.** Illinois Agric. Exp. Sta. Circ. 266. *1–16. Fig. 1–2.* 1923.—Directions for spraying apples, cherries, peaches, pears, plums, brambles, currants, gooseberries, grapes, and strawberries, are given.—*H. A. Lunt.*

9278. ILLINOIS AGRIC. EXP. STA. **Directions for spraying fruits in Illinois.** Illinois Agric Exp. Sta. Circ. 277. *1–24. Fig. 1–3.* 1924.—The spraying schedules for apples, pears, peaches, plums, brambles, currants, gooseberries, grapes, and strawberries are given. Directions for making and mixing the standard sprays are included.—*H. A. Lunt.*

9279. JOHNSON, JAMES. **Tobacco diseases and their control.** U. S. Dept. Agric. Bull. 1256. *1–56. Pl. 1–17, fig. 1–24.* 1924.—This is a semi-popular discussion of all the diseases of the tobacco plant known to occur in the U. S. A. It is intended primarily as a handy reference for farmers and county agents. As far as possible each disease is treated under the 4 heads: Description, cause, conditions favoring the diseases, and control.—After a general discussion, the following diseases are treated: Damping-off or bed rot, sore-skin, stem rot, black-shank, hollow-stalk, Granville-wilt, Fusarium wilt, black root-rot, brown root-rot, root-knot, broom-rape, wildfire, black-fire, Wisconsin leaf-spot, frog eye, blue-mold, other parasitic leaf-spot diseases, non-parasitic leaf spots, mosaic, frenching, sand-drown, potash starvation, other malnutrition symptoms, injuries due to physical agencies, and unimportant or rare diseases not otherwise classified. Damages in curing and fermentation are treated under shed-burn or pole rot, stem-rot, wet-butts or fat-stem, white veins, black-rot, musts, and molds. A brief discussion of diseases of tobacco in foreign countries and a bibliography of 123 titles of publications from the U. S. A. is appended.—*James Johnson.*

9280. JONES, L. R. **The relation of environment to disease in plants.** Amer. Jour. Bot. **11**: 601–609. *3 fig.* 1924.—Attention is called to the importance of the effect of the environment, especially soil temperature, in plant diseases. This may be due to a direct effect of temperature upon the vegetative activities of the parasite, as in the Fusarium diseases; upon spore germination, as in the onion smut; or upon the host itself, probably indirectly, by affecting the length of the period of susceptibility. Temperature should be taken into account in problems of quarantine and disease control. The importance of physiological research in plant pathology is emphasized.—*E. W. Sinnott.*

9281. KALSHOVEN, L. G. E. **Iets over het onderzoek van schadelijke bosch- en houtinsecten. [Investigation of forest pests and wood destroyers.]** Tectona **17**: 1130–1142. 1924.

9282. LINK, G. K. K. **Diseases an important factor in the transit and storage of potatoes.** Proc. 11th Ann. Meeting Potato Assoc. America **1924**: 60–66. 1925.—The diseases of potatoes in transit and storage are discussed under the 3 main heads: (1) The nature and types of the transit and storage diseases of the potato; (2) the nature and extent of the losses induced by them; and (3) the responsibility for these losses. Examples of the different types of disease are given and discussed. Out of 2,749 cars of potatoes inspected by the Bureau of Agricultural Economics in 1921, 538 contained from 1 to 70% of late blight tuber rot, while out of 6,035 car inspections, 1,405 showed from 1 to 85% of Fusarium tuber rots. In some instances potatoes infected with Fusarium rot showed losses of from $\frac{1}{3}$ to $\frac{3}{4}$ of all the tubers in large commercial storage cellars, while cars arriving in markets sometimes showed from 25 to 50% of the tubers so badly rotted with powdery dry rot as to be unmarketable. The fixing of responsibility for losses in transit and storage is thought to present a real scientific problem. The carriers of perishable products are turning more and more to the plant physiologist and plant pathologist for data necessary to the fixation of blame and settlement of claims.—*W. Stuart.*

9283. MCHATTON, T. H., AND GEORGE H. FIROR. **Spray calendar for Georgia.** Georgia State Coll. Agric. Bull. 220. *1–16. 1 fig.* 1925.—Contains a spray calendar for the common fruits and vegetables of the state with instructions and directions for mixing and applying all the necessary sprays.—*T. H. McHatton.*

9284. MCINDOO, N. E., AND A. F. SIEVERS. **Plants tested for or reported to possess insecticidal properties.** U. S. Dept. Agric. Dept. Bull. 1201. *1–61.* 1924.—The object of this investigation, begun in 1915, was to search for new insecticides in the plant kingdom. The first 23 pages are devoted exclusively to the authors' results, and the remaining pages to an alphabetical catalogue of all the plants tested for or reported to possess insecticidal properties. The purpose of the catalogue is to serve as a handy reference and to encourage research along this line of work. The authors prepared 232 preparations from 54 species of plants, and tested them against the following species of insects: squash lady-beetle (*Epilachna borealis* Fab.), potato beetle (*Leptinotarsa decemlineata* Say), house fly (*Musca domestica* L.); 17 species of aphids belonging to *Aphis*, *Macrosiphum*, *Macrosiphonella*, and *Myzus;* honeybee (*Apis mellifica* L.), sawfly larva (*Neurotoma fasciata* Nort.), silkworm (*Bombyx mori* L.), catalpa caterpillar (*Ceratomia catalpae* Bvd.), fall webworm (*Hyphantria cunea* Dru.), tent caterpillar (*Malacosoma americana* Fab.), cockroach (*Blattella germanica* L.), and grasshopper (*Melanoplus femur-rubrum* DeG.). There are 95 references cited.—*N. E. McIndoo.*

9285. Martin, Wm. H. **Potato spraying and dusting tests in 1922.** New Jersey Agric. Exp. Sta. Ann. Rept. **44**: 356–364. 1923 [1924].—In a test with the American Giant variety, 7 applications of home-made Bordeaux mixture of the standard 5–5–50 formula gave an average increase of 69.4 bushels as compared with 26.5 bushels for a proprietary Bordeaux mixture. The latter applied in the dust form gave an increase of 20.2 bushels. Plots dusted 7 times with copper-lime dust showed a decrease of 20.2 bushels as compared with the checks; the yield data did not include the many rotted tubers found on these plots.—In a test with the Irish Cobbler variety, the average yield of unsprayed plots was 169.4 bushels per acre as compared with 201.7, 218.2 and 185.5 bushels for the plots receiving all-season, early, and late applications of 5–5–50 Bordeaux mixture.—In a test with late planted Irish Cobblers, plots sprayed with 5–5–50 Bordeaux mixture prepared with stone lime showed an increase of 16.5 bushels over the unsprayed check, while adjoining plots sprayed with 5–7.5–50 Bordeaux mixture prepared with hydrated lime showed an increase of only 5.6 bushels. The addition of Kayso to the Bordeaux apparently did not increase its fungicidal value. In a 2nd test with late planted Cobblers, the yield of the sprayed and dusted plots was less than that of the check, due to the early killing of the vines by frost.—*Author.*

9286. Martin, Wm. H. **Potato spraying vs. dusting in New Jersey.** Proc. 11th Ann. Meeting Potato Assoc. America **1924**: 67–74. 1925.—Tests were conducted for 4 years in New Jersey, to determine the relative efficiency of the copper-lime dusts and of Bordeaux mixture, for the control of insects and diseases of the potato. Plots were replicated 4–6 times. Observations on condition of foliage during the latter part of the growing season indicated that much the better protection against both insects and diseases was afforded by Bordeaux mixture. Early and late blights, tip burn, leaf hoppers and flea beetles were the pests present. The plots sprayed with Bordeaux mixture gave an average increase in yield of 13.9%, and those dusted gave an increase of 1.4%, over the untreated checks.—*J. T. Rosa.*

9287. Mestrezat, W. [Rev. of: Calmette, A., L. Negre, et A. Bouquet. **Manuel technique de microbiologie et de serologie. (Manual of microbiological and serological technique.)** *568 p.* Masson et Cie: Paris, 1925.] Bull. Soc. Chim. Biol. **7**: 452. 1925.

9288. Murray, J. C. **[Report of southern field assistant.] Mackay District.** Australian Sugar Jour. **17**: 159–160. 1925.—In the Homebush District, mosaic disease has been present for a number of years, but has spread only to a very limited extent. This would indicate that Malagache, which has long been the staple variety of cane in this District, is fairly resistant to mosaic.—To destroy fungi on the cane plants it is suggested that farmers make their planters water tight and treat the sets with a fungicide, immersion for an hour in 50 gallons of water to which ½ pint of formalin has been added being suggested in this connection. The use of burnt lime has given good results. The lime should be placed in heaps about the land, covered with soil, allowed to air slack, spread in the absence of wind, and plowed in and the ground allowed to spell for 6 weeks, this to be followed if possible with a crop of cowpeas.—*Nellie E. Fealy.*

9289. Patay, R. **Sur l'extension aux Flagellés d'un fixateur de Noguchi pour Spirochètes. [Extension to flagellates of one of Noguchi's fixatives for Spirochaetes.]** Bull. Soc. Path. Exotique **18**: 305–306. 1925.—Parasites of the genera *Trypanosoma*, *Spirochaeta*, *Giardia*, *Octomitus*, *Trichomonas*, and *Trichomastix* were stained as well after this fixative as after fixation with osmic acid. Disodium phosphate N/15, 88 parts, and monopotassium phosphate N/15, 12 parts, are combined; 9 parts of the mixture are then added to 1 part of commercial formalin. The minimum time for fixation is 5 minutes.—*Philip Brierley.*

9290. Pole Evans, I. B. **Report No. 6. Botany and plant pathology.** Jour. Dept. Agric. Union of South Africa 9: 542–546. 1924.—Field experiments have clearly illustrated that the citrus canker organism (*Bacterium citri*) may remain dormant in the soil for as long as 6 years.—A rosette disease of peanuts under investigation for some time has been found to be identical with Zimmermann's, "Krauselkrankheit" and Rutger's "Krulziekte" and is generally thought to be a disease of the mosaic type. As a result of field observation and experiment the conclusion has been definitely formed that the condition of the Uba and certain other varieties of cane which has become known as "streak disease" is not identical with the well known "mosaic" disease of sugar cane, although a disease of similar type. The variegation disease, leaf stripe or yellowing of maize, well known for many years in Natal, was shown to fall into line with the streak disease of cane and to bear a similar relation to the mosaic disease known to be transferable between these 2 hosts. Mosaic and streak diseases have been found also upon a number of grasses. The transfer of mosaic disease has been effected experimentally by means of the common maize aphis (*A. maidis*) to sugar-cane, maize and veld grasses. This insect failed to act as the vector of streak disease, which, however, was experimentally transferred in maize by a leaf hopper. A policy of eradication of all cane susceptible to mosaic disease has been recommended to the sugar industry.—Other diseases investigated include a brown spot in pineapples due to a species of *Penicillium*. Infection takes place during the flowering stage; the fungus enters the flower between the withered flower parts and after causing decay in the base of these organs penetrates the base of the flower and there sets up a characteristic rot.—The following diseases are under investigation: Scaly bark in citrus, foot-rots of wheat, diseases of forest trees, and chlorosis of stone-fruits.—*L. I. Goldblatt.*

9291. Poole, R. F. **Tomato disease investigations.** New Jersey Agric. Exp. Sta. Ann. Rept. **44**: 376–386. 1923 [1924].—Observations are presented on the prevalence of tomato diseases in 1922. In a test with the Baltimore tomato to compare the fungicidal value of Bordeaux mixture (4–4–50), Bordeaux plus potash fish oil soap, and copper lime dust, the 1st gave an increase of 2,860 pounds over unsprayed checks as compared with 7,003 and 647 pounds respectively for the other two. These same materials were tested on early and 2nd early Bonny Best tomatoes. On the former, the Bordeaux mixture gave an increase of 2,776 pounds, the Bordeaux-soap mixture 3,369 and the copper-lime dust 2,040 pounds. The increases here were 1,749, 1,458 and 618 pounds, respectively. Spraying was found to greatly reduce the amount of fruit rot and leaf infection by the Septoria leaf spot. While some control followed the use of copper-lime dust the results were not comparable with those obtained with the liquid treatments. At the 1st picking there was little difference in size in the fruit from the treated and untreated plots; by the middle of September, however, the fruit from the former plots was considerably larger and better colored than that from the latter. Applications of nitrogen were found to be important in determining the severity of foliage and stem infection from leaf spot (*Septoria lycopersici* Speg.). On plots receiving no fertilizer for several years, there was little infection. Most severe infection was found on plots where 1000 pounds or more of a fertilizer carrying 6–12% nitrogen was applied. Where the nitrogen was reduced to 2–5% the leaf spot infection was less severe. Despite the difference in amount of infection, the largest yields were obtained on the heavily fertilized plots. Observations on streak on greenhouse tomatoes indicate that the disease spreads slowly and that in general its spread is favored by cloudy days. While a few plants were affected when very small, in most cases streak did not appear until the plants were 12–18 inches high.—*Wm. H. Martin.*

9292. Reddick, Donald. **Plant pathology.** Bull. U. S. Bur. Education **1925^4**: 39–43. 1925.—This is Chapter VII of a compilation entitled "Land-grant College Education, 1910 to 1920. Part III. Agriculture." The development of research, teaching and extension teaching in plant pathology in the "Land-grant" colleges of the U. S. A. is treated briefly from its inception. "The blending of the so-called pure and applied in the development of plant pathology has been accomplished chiefly through the education of a new generation of workers, trained alike in the technique of the laboratory and of the field, intimately acquainted not only with the practical phases of the subject and the significance of them but equally alert to the most abstruse theoretical considerations."—*Author.*

9293. Robinson, R. H. **The use of skim milk in the preparation of certain spray materials.** Jour. Econ. Entomol. **17**: 396–400. 1924.—The advantages of using skim milk or milk powder in the preparation of certain sprays are discussed. A method is outlined for the use of milk in preparing a substitute for the different sulphur sprays used as summer fungicides. A mineral oil emulsion that may be prepared by using skim milk, and hydrated lime as an emulsifier is described. The use of skim milk, any of the condensed milks, or milk powder as a spreader is recommended. These products will improve the spreading properties of the spray as well as calcium caseinate, and at a much lower cost.—*Author's abstract.*

9294. Rose, D[ean] H. **Diseases of apples on the market.** U. S. Dept. Agric. Dept. Bull. 1253. *1–24. Fig. 1–8.* 1924.—". . . . there is a great variety of diseases in the commercial apple crop of the United States and a rather heavy loss from disease in a portion of that crop.—Considering the inspections for the four-year period as a whole, blue-mold rot occurred more commonly than any other disease. In the box crop scald was second and decay third; in the barrel crop decay came second, followed by black-rot.—Twelve diseases were reported in the box crop, 18 in the barrel crop, with 9 diseases common to both. . . . . Summer and fall varieties showed less disease, on the average, than winter or long-storage varieties.—The box crop showed a steady increase in percentage of disease from October till June; the barrel crop only from December till June."—Percentage of disease increases with length of storage. The percentage of disease in the barrel crop was less in cars from New York, Michigan, Virginia and West Virginia than from all other Eastern States as a whole; the percentage in the box crop was slightly heavier in cars from Idaho than from all other Western States as a whole.—The data at hand seem to indicate that large apples are more susceptible than small ones to blue-mold rot, decay, scald, internal breakdown and water-core, and that Fancy grade apples suffer more from scald than Extra Fancy grade.—*Frederick V. Rand.*

9295. Smith, Erwin F. **Some newer aspects of cancer research.** Science **61**: 595–601. 1925.—Cancer cells are unlike normal cells in that lactic acid is produced in excess in their metabolism. This acid production is accomplished by anaerobic, splitting processes and, with other evidence, serves to support the "oxygen-hunger" theory of the abnormal multiplication in cancerous growths. The causal organism in the virus of chicken sarcoma of Rous as cultivated by Gye of London has been demonstrated by Barnard. As viewed by special objectives and monochromatic light it is seen to be "the same type of germ as the pleuropneumonia organism, but smaller."—Through the work of Ferdinand Blumenthal and assistants in Berlin, a bacterium resembling *Bacterium tumefaciens* has been isolated from human breast cancers and shown to cause malignant tumors in rats and crowngall in plants. This work has been duplicated in part at a laboratory in Dresden and promises to establish the bacterial nature of certain cancerous growths.—*C. J. Lyon.*

9296. Smith, Ralph E. **Efficiency of a self-mixing duster.** Phytopathology **15**: 235–237. *Fig. 1.* 1925.—A dusting machine with an agitating device for mixing the chemicals to be applied has been devised by members of the Division of Plant Pathology of the California Experiment Station and built by the Bean Spray Pump Company, San José, California. To test the efficiency of the mixing device hydrated lime was poured into the hopper and various amounts of nicotine sulphate solution were poured over the surface. The agitator was then run for 2 minutes and samples were taken from the top and bottom of the hopper. Quantitative tests for nicotine in the samples showed it very evenly mixed throughout.—*B. B. Higgins.*

9297. Smith, R. H. **Spreaders in relation to theory and practice in spraying.** Jour. Econ. Entomol. **16**: 201–207. 1923.—Fog spraying works out poorly. Much can be said for high power spraying. Spreaders give a uniform covering with low pressures. Substances with very low surface tensions, such as saponin and soaps, give too thin coatings; caseinate gives a thicker film deposit without affecting compatibility. Wind and rain doubtless affect efficiency. A suitable spreader, such as calcium caseinate, increases efficiency, as shown by tests with the codling moth (*Carpocapsa pomonella*), green apple aphis (*Aphis pomi*), and wooly apple aphis (*Eriosoma lanigera*).—*Author.*

9298. Stearns, L. A., and W. S. Hough. **Spreader tests on apples and peaches.** Jour.

Econ. Entomol. **16**: 198–201. 1923.—Casein and flour-paste have received considerable attention for some time as spreaders and adhesives in spray solutions. In 1922, orchard tests were conducted with Kayso, a prepared casein spreader, and Magnet Dry Paste, a prepared flour-paste spreader to determine their effectiveness as influencing the spreading and adherence of the summer applications in the scheduled programs for apple and peach spraying in Virginia. Neither of the spreaders used increased the effectiveness of the spray solution in protecting the fruit from insects and diseases. The same was true in the case of the foliage. It is doubtful whether the addition of a spreader, such as the 2 used, would pay for the increased cost of the spray. Nicotine sulphate 40% (Black Leaf 40) and casein (Kayso), as used, were uncongenial.—*Authors.*

9299. Stearns, L. A., and W. S. Hough. **Spreader tests on apples and peaches: a second report.** Jour. Econ. Entomol. **17**: 274–279. 1924.—The efficacy of a casein spreader (Kayso) in the commonly recommended sprays for apple and peach has been studied for the 2nd season. These sprays, with and without the spreader, were mixed by the writers and applied by the regular orchard force. The 2nd season's results parallel those of the 1st. There is no indication that the incorporation of the spreader with the usual sprays influences the protection of the fruit from insects and diseases. The conclusion is that the use of a casein spreader (Kayso) in the apple and peach sprays under orchard conditions in Virginia is not justified from the standpoints of effectiveness and economy.—*Authors.*

9300. Tucker, C. M. **La pudrición del cogollo del cocotero en Puerto Rico. [Coconut bud rot in Porto Rico.]** Rev. Agric. Puerto Rico **12**: 385–390. *2 pl.* 1924.—Typical coconut bud rot has appeared on the west coast of Porto Rico. On infected trees the inner leaf turns yellow and finally falls. Surrounding leaves gradually turn yellow and fall away. A strong-smelling soft rot destroys the bud. The disease is transmitted by wind and insects. The only known method of control lies in the destruction of infected trees.—*John A. Stevenson.*

9301. Turner, Wm. F., Oliver I. Snapp, C. H. Alden, J. W. Roberts, and J. C. Dunegan. **Curculio and brown rot control.** Georgia State Bd. Entomol. Circ. 37. *1–8.* 1923.—This circular is mainly a progress report of work being conducted in Georgia on the control of curculio and brown rot. The spray schedule recommendation gives 4 applications of sprays as follows: Arsenate of lead immediately after the petals have fallen, 2nd application when the calyces are shedding and peaches are exposed, 3rd application 2 weeks after the 2nd with self-boiled lime-sulphur, 4th application 4 weeks before the variety ripens, with self-boiled lime-sulphur and arsenate of lead. The periods of dust applications are the same as for liquid sprays.—*T. H. McHatton.*

9302. Williams, Ira W. **Annual report of the State Entomologist for 1922.** Georgia State Bd. Entomol. Bull. 64. *1–10.* 1923.—The Georgia State Board of Entomology carries on experimental, investigative and inspection work in cotton breeding, field testing and work in connection with quarantine regulations. The Board maintains rigid quarantine regulations relative to the shipment of nursery stock into and within the state, the shipment of sweet potato plants, the control of chestnut blight (*Diaporthe parasitica* Murrill) and its importation into the state, citrus canker (*Pseudomonas citri* Hasse), pine blister rust (*Cronartium ribicola* Fisch. de Waldh.), mosaic diseases of sugar cane, the sweet potato weevil (*Schizocerus privatus* Norton), cotton pink boll worm, and the Mexican bean beetle (*Epilachna corrupta* Muls.).—*T. H. McHatton.*

9303. Williams, Ira W. **Annual report of the State Entomologist for 1923.** Georgia State Bd. Entomol. Bull. 65. *1–15.* 1924.—The State Board of Entomology is doing work along the following lines: Assisting the farmers in insect control and furnishing calcium arsenate at cost, maintaining experiment stations in insect control work, furnishing information to the cotton growers for control of the boll weevil under Georgia conditions, developing strains of cotton resistant to disease, maintaining a sweet potato inspection service, helping in the control of watermelon diseases, inforcing the quarantine regulations of the State, maintaining the nursery inspection, parcel post inspection and railway and port inspection, eradicating foul brood of bees, conducting fertilizer and other experiments with peaches as well as with apples, cooperating in investigations concerning tobacco insects and diseases and in the control of general orchard and vegetable pests.—*T. H. McHatton.*

9304. Wolf, F. A., and S. G. Lehman. **Report of the Division of Plant Pathology.** Ann. Rept. North Carolina Agric. Exp. Sta. **47:** 82–85. 1924.—A formal statement of investigational work on certain diseases of soybeans including mildew, anthracnose, bacterial pustule and brown spot, on cotton anthracnose control by use of dry heat, on varietal tests of wheat for take-all control, and on dewberry anthracnose control.—*F. A. Wolf.*

PHARMACEUTICAL BOTANY AND PHARMACOGNOSY

Heber W. Youngken, *Editor*
E. N. Gathercoal, *Assistant Editor*

(See also in this issue Entries 8227, 8229, 8277, 8298, 8302, 8414, 8573, 8613, 8797, 8814, 8897, 8909, 8911, 9057, 9328, 9397 9400, 9402, 9441, 9474, 9479, 9482, 9489, 9493, 9646)

9305. Anonymous. **Chaulmugra oil a reported specific for leprosy.** Missouri Bot. Gard. Bull. 9: 87–89. *Pl. 22.* 1921.—A popular account of the oil and one of the trees, *Hydnocarpus Kurzii*, which produces it.—*O. T. Wilson.*

9306. Anonymous. **Medicinal plants of our local flora.** Missouri Bot. Gard. Bull. **10:** 118–123. 1922.—The first instalment of a list and descriptions of the uses of medicinal plants of the St. Louis district.—*O. T. Wilson.*

9307. Anonymous. **Medicinal plants of our local flora (Continued).** Missouri Bot. Gard. Bull. **10:** 137–142. 1922.

9308. Anonymous. **Medicinal plants of our local flora (Continued).** Missouri Bot. Gard. Bull. **10:** 153–157. 1922.

9309. Anonymous. **The African oil palm.** Missouri Bot. Gard. Bull. **9:** 142–146. Pl. *32.* 1921.—A discussion of the utility of *Elaeis guineensis.*—*O. T. Wilson.*

9310. Anonymous. **The hydrogenation of vegetable and marine oils by a continuous process.** Tropic. Life **21:** 41–43, 57–60. 1925.—This article (Part I in Ibid, No. 3; Part II in Ibid, No. 4) contains a report of a paper read by R. A. Bellwood before the Hull Chemical and Engineering Society, published also in the Chemical Trade Journal, Manchester, England. —The advantages claimed for the continuous process are reduction in the cost of catalyst, labor, power, land, and buildings. The catalyst is reactivated practically without loss and restored to 100% efficiency. Free fatty acids do not increase during hydrogenation unless water is admitted to the hydrogenation vessels. The catalyst remains in an atmosphere of hydrogen throughout its life and retains its activity over a much longer period than when in powder form. The hydrogenized oil has an average nickel content of only 1 part in 10,000,000, considerably less than the arsenic allowed by law in food products.—*H. N. Vinall.*

9311. Anonymous. [Rev. of: Richaud, A. **Precis de thérapeutique et de pharmacologie. (Compendium of therapeutics and pharmacology.)** *6th ed., 1007 p.* Masson et Cie: Paris, 1924.] Bull. Soc. Chim. Biol. **7:** 336. 1925.—Notice of the appearance of the 6th edition of Richaud's work, the 1st edition of which was published in 1908.—*Joseph S. Caldwell.*

9312. Cengia,Sambo, Maria. **Le piante medicinali dell 'Urbinate. [Medicinal plants of Urbino.]** Bull. Soc. Bot. Italiana 1925^{4}: 91–104. 1925.—A study was made of 230 medicinal plants found in various parts of the province of Urbino, the results of which were published for the use of School of Pharmacy students of Urbino. Among these there are said to occur 49 species extensively used in pharmacy, which could be readily grown for industrial purposes. Only 5 of these, however, are actually available.—*Author.*

9313. Dardanne, A. **Contribution a l'Etude du Chanvre Indien et en particulier de son employ comme drogue sensorielle dans l'Africa du Nord. [Indian Hemp and its use as a drug in North Africa.]** *152 p.* Vigot Frères: Paris, 1924.—Description, morphology and anatomy are included. One botanical species with several forms is noted, some of which have been described as distinct species. The Indian hemp, described by Lamarck as *Cannabis indica*, is merely a form of *C. sativa.* The influences of cultivation, climate, temperature, light and altitude are discussed. Heat and aridity tend to increase the secretion of the resin. Methods of producing hasheesh, its use as a narcotic in different countries, and the preparation of the drug and its use in medicine are described. The type of hemp grown in India, Arabia, Africa and Mexico for the production of the narcotic resin known as hasheesh, bhang, kiff and marihuaua, does not produce a fiber of any value.—*L. H. Dewey.*

9314. FINCKE, HEINRICH. **Kleine Beiträge zur Untersuchung von Kakaobohnen und Kakao-Erzeugnissen (Zweite Mitteilung). [Investigation of cacao beans and cocoa substitutes.]** Zeitschr. Untersuch. Nahrungs- u. Genussmittel **48**: 293-305. 1924.—This paper embodies the results of chemical and physical investigation of a considerable number of samples from various sources.—*E. E. Stanford.*

9315. FRANCOS, G. **Pyrethrum.** Cyprus Agric. Jour. **20**: 21, 22. 1925.—Pyrethrum was imported into Cyprus in 1897 and was successfully grown in all the government nursery gardens. The plants blossom all the year round, they may be propagated either from seed or by shoots. *Pyrethrum cinerariaefolium* is the species grown in Cyprus for insecticidal purposes and is commonly known as Dalmatia pyrethrum. Seed may be sown in the autumn or spring. The young plants are set 1 foot apart in the rows. Frequent irrigation is necessary. The flowers should be gathered before they are opened, preferably before sunrise; soon after gathering they are spread in layers on sheets to be dried in airy rooms, and always in shady places. Daily turning of the flowers is necessary until they are perfectly dry. The dried flowers are put into sacks of 40 to 80 okes each, or approximately 166 to 332 pounds by weight. Pyrethrum dust is obtained by grinding the flowers. The drop is considered profitable.—*W. Stuart.*

9316. GALANOS, SPYROS. **Beiträge zur Kakaountersuchung. [Cacao investigations.]** Zeitschr. Untersuch. Nahrungs.- u. Genussmittel **48**: 207-211. *Pl. 1-4.* 1924.—Adulteration of cocoa with ground cocoa-shells is reported as common. Such adulteration may be investigated by microscopic, physical, or chemical means. The microscopic method is of primary importance, but is difficult to carry out when the shells are finely powdered. Physical determinations depend on the higher specific gravity of the powdered shell. Previous chemical work is reviewed. Determinations of moisture, ash, sand, alkalinity of ash, phosphate, fat and its refractive index, starch, protein, crude fiber, theobromine, etc., are reported and tabulated from samples of cocoa and shell from several geographical sources. The author concludes that the high sand-content of shell, the refractive index of the fat, the character of alkalinity of ash, and the crude fiber content may confirm microscopical evidence of adulteration with shell, but that the microscopical investigation must remain the chief line of attack. —*E. E. Stanford.*

9317. GALANOS, SPYROS. **Über Kakaoschlenfett. [Fatt of cocoashells.]** Zeitschr. Untersuch. Nahrungs- u. Genussmittel **48**: 212. 1924.—Continuation of investigations previously reported.—*E. E. Stanford.*

9318. GARRATT, GEORGE A. **Poisonous woods.** Jour. Forest. **20**: 479-487. 1922.—The author discusses the source, uses, and toxic properties of cocobolo (*Dalbergia retusa, D. hypoleuca,* and *D. granadillo*), Knysna boxwood or Kamassi wood (*Gonioma kamassi*), East Indian satinwood (*Chloroxylon swietenia*), teak (*Tectona grandis*), cocus wood or green ebony (*Brya ebenus*), sabicu wood (*Lysiloma sabicu*), Indian rosewood (probably *Dalbergia latifolia*), moa wood or black butt (*Eucalyptus sp.*), tagayasan (speiies not known) and, very briefly, of ebony, Bornea rosewood, magenta rosewood, olive wood, mahogany, Brazilian peroba, Mexican blue gum, and partridge wood. Dust from working the wood makes the poisonous properties felt. Bethabara (*Tecoma sp.*) and tonquin (*Dipterix odorata*) are mentioned as dyes.—*Philip C. Wakeley.*

9319. GERRY, ELOISE. **Effect of height of chipping on oleoresin production.** Jour. Agric. Res. **30**: 81-93. *Pl. 1-3, fig. 1.* 1925.—The author discusses a series of comparative tests carried out on 3 groups of pine trees which were chipped to the same depth but at varying heights for the purpose of ascertaining the effect of the height of the chipping on the quantity of oleoresin produced. It was found that the low chipping permitted the longest maximum production in any year, since the face is cut in the region richest in oleoresin passages, that it also makes possible the holding over of a reserve of the oleoresin-containing tissue to augment production during a part of the following year and further, that preventable waste is caused by high chipping, since it removes more than is necessary of the rich gum-bearing tissue before it has had time to give the yield of which it is capable.—*H. W. Youngken.*

9320. Gopal Rao [Rau], Madyar. **The constituents of some Indian essential oils: Note on the rate of oxidation of $d-\Delta^{-3}$ carene and other terpenes in the presence of catalysts.** Indian Forest Rec. 11^5: 197–206. 1925.

9321. Gopal Rau, Madyar, and John Lionel Simonsen. **The constituents of some Indian essential oils: Abietic acid from the rosin of Pinus longifolia.** Indian Forest Rec. 11^6: 207–214. 1925.

9322. Griebel, C. **Ergebnisse der Untersuchung von Heilmitteln und Geheimmitteln, kosmetischen und ähnlichen Mitteln. [Investigation of medicinals, proprietaries, cosmetics, etc.]** Zeitschr. Untersuch. Nahrungs. - u. Genussmittel 49: 120–125. 1925.—Continuation of previous work on these subjects. Reports on the composition of 79 samples, mostly proprietaries.—*E. E. Stanford.*

9323. Gunn, J. W. C., Morris Goldberg, and J. H. Ferguson. **A note on the pharmacological action of Scilla Cooperi Hook. fil., Scilla Rogersii Baker, and Scilla lanceaefolia Baker.** Trans. Roy. Soc. South Africa 12: 1–3. 1924.—The 3 South African varieties of *Scilla* discussed in this paper have the action of the digitalis group. Only one, *Scilla rogersii*, is as active as *Urginea scilla.*—*E. M. Doidge.*

9324. Haralambides, A. **Otto of roses.** Cyprus Agric. Jour. 20: 78. 1925.—According to the author the present day distillation of oil of roses is almost wholly confined to Bulgaria and France. It is believed that the art of distilling roses originated in Persia. Mention is made in a document contained in the National Library, Paris, that between the years 810–817 A.D. the province of Foristan was required to pay an annual tribute of 30,000 bottles of rose water to the treasury at Bagdad. It is believed that the art of distilling roses was introduced into western countries by the Arabs. The Bulgarian plantations are situated in the Balkans, with Kezanlik the center of the industry. Roses flourish best on sandy sun-exposed slopes with a south or south-eastern aspect. *Rosa Damascena,* a red rose, is the one generally grown. The flowers are gathered before they begin to open, before sunrise, and the picking is usually continued till 10 or 11 o'clock. They should not be picked when the sun's rays are on them. An acre of roses will yield 120 pounds of flowers daily for 4 weeks. Directions are given for the operation of the still.—*W. Stuart.*

9325. Kramer, Wm. P. **El arbol de chaulmoogra. [The chaulmoogra tree.]** Rev. Agric. Puerto Rico 14: 137–147. *5 pl.* 1925.—The chaulmoogra tree is being grown experimentally in Porto Rico from seed obtained in Burma by J. F. Rock. The leprosy situation in Porto Rico and the U. S. A. is reviewed.—*John A. Stevenson.*

9326. Lauritsen, L. P. **Er Billebo-Klaseskaerm (Oenanthe aquatica L.) giftig? [Is Oenanthe aquatica L. Poisonous?]** Tidsskr. Landøkonomi 4: 195–197. 1925.—The author claims that *Oenanthe aquatica* L., commonly known as Billebo-Klaseskaerm in Denmark, is poisonous to horses and cattle, while sheep reject the plant.—*Albert A. Hansen.*

9327. Marsh, C. Dwight, and A. B. Clawson. **The woolly-pod milkweed (Asclepias Eriocarpa) as a poisonous plant.** U. S. Dept. Agric. Bull. 1212. *1-13. Fig. 1-7.* 1924.—The woolly-pod milkweed, *Asclepias eriocarpa,* grows from Mendocino County southward in California, and has been suspected of being poisonous to sheep. There have been no definite data in regard to the effect of the plant, and this bulletin gives the details of a series of feeding experiments upon sheep and cattle. The experiments show conclusively that the plant is very poisonous, both to cattle and sheep, and presumably would have the same effect on horses, although no experimental work has been undertaken on these animals. The data of the bulletin include a discussion of the symptoms, the time before symptoms develop, the duration of sickness, the autopsy findings, and the microscopic changes in tissues. It is shown that it is an extremely poisonous plant, as small a quantity as 0.1% of animal weight producing intoxication and 0.22% of animal weight death in sheep. Cattle are equally susceptible with sheep. While the plant is not sought by either cattle or sheep. yet where other forage is lacking, they may eat it and with disastrous results.—*C. D. Marsh.*

9328. Marsh, C. Dwight, Glenwood C. Roe, and A. B. Clawson. **Cockleburs (species of Xanthium) as poisonous plants.** U. S. Dept. Agric. Bull. 1274. *1-23. Pl. 1-4.* 1924.—For many years there have been reports of the poisoning of animals, more particularly of pigs, by cockleburs (*Xanthium* spp.), but the reports have been contradictory and little definite knowledge has been published. In the work here reported, a large number of experimental feedings were made with swine, cattle, sheep, and chickens, and the plant was shown to be poisonous to all these animals. A somewhat detailed account is given of the symptoms produced, of the autopsy findings, the microscopic changes in tissues, and the effect of continued feedings.—It was found that the poisoning was produced by the plants in the cotyledon stage only. In general, the lethal dose for pigs was about 1½% of the weight of the animal, and the toxic dose about ½ that quantity. The plant is about equally poisonous to pigs and sheep. It took about twice as much to poison cattle as pigs and sheep, and it was found to be still less poisonous to chickens. The reported losses from the plant are mainly of pigs and cattle. Apparently, the green plant is somewhat more poisonous than the dried plant. As a result of experiments upon remedies, it was found that the fats and oils, like bacon grease, lard, and linseed oil, produce marked beneficial effects on poisoned animals. An account is given of the preceding publications upon the subject of cocklebur poisoning and a bibliography of the species of *Xanthium* as poisonous plants.—*C. D. Marsh.*

9329. Munesada, T. **On the chemical constituents of Matteuccia orientalis.** Ber. Ohara Inst. Landw. Forsch. **2**: 429–434. *1 fig.* 1924.—The author obtained 2 substances from the acetone extract of dried rhizomes and stripes of this fern. A crystalline substance to which he gave the name matteucinol, had a formula $C_{14}H_{14}O_4$ and melted at 167–170°C. The saponification value was 201. The 2nd substance was amorphous, but was converted into crystalline needles after being heated with acetic anhydride. These needles melted at 140–142°C. and had the same composition as matteucinol.—*H. S. Reed.*

9330. Osada, Shoji. **Über die mydriatisch wirkenden Alkaloide der Daturaarten. (1. Mitteilung). [The mydriatic alkaloids of the Daturas (1st communication).]** Arch. Pharm. u. Ber. Deutsch. Pharm. Ges. **1924**: 277–291. 1924.—The alkaloidal content of the stems, seed, pericarps, etc., of *Datura meteloides* and *D. alba* was examined by the author. The plants are quite similar and it is a question which was the original. The author also states that the seed growing wild in Formosa have a higher scopolamine but a lower hyoscyamine and atropine content than those from cultivated plants. A portion of the paper is given to a discussion of the constitution of the alkaloids.—*Elmer H. Wirth.*

9331. Plahl, Wilhelm. **Zum Nachweis der bitteren Mandeln in süssen und ihre hygienische Beurteilung. [Determination of bitter almonds in sweet almonds and their relation to health.]** Zeitschr. Untersuch. Nahrungs.- u. Genussmittel **48**: 241–243. 1924.—The presence of bitter almonds in sweet almonds may be demonstrated by tasting and also by the bitter-almond odor given off when scrapings are placed in water. A preferable method involves the Schönbein reaction for HCN. Filter paper is soaked in freshly prepared, 3% alcoholic solution of guaiac resin, dried, moistened with 1% $CuSO_4$ and held over a receptacle containing a piece of almond in water. If HCN is liberated (from bitter almonds) the moistened portion of the paper turns blue. About 40 bitter almonds contain the equivalent of a fatal dose, of HCN namely, 0.05 g.; 3 or 4 bitter almonds in 100 g. render preparations of such material bitter. As the HCN is volatile, the amount left in a foodstuff depends on the method of preparation.—*E. E. Stanford.*

9332. Rindl, M. **Preliminary note on a poisonous alkaloid from the overground portions of the Transvaal yellow tulp (Homeria pallida).** Trans. Roy. Soc. South Africa **11**: 251–256. 1924.—The author states that *Homeria pallida* is responsible for heavy losses among stock when eaten either in the dried or fresh condition. The active principle, obtained by extraction of dried material with various solvents, is found to be an alkaloid. Physiological tests showed that the principle exerts a digitalis-like action on the circulation and is a cardiac poison in large doses. Although it has not yet been possble to obtain the alkaloid in a form suitable for chemical analysis, and thus to assign a definite formula to it, the physiological results indicate that it is an alkaloid hitherto undescribed. With the exception of erythrophleine, which shows different chemical behavior from the alkaloid under consideration, no other alkaloid is known to exert a digitalis-like action.—*E. S. Moore.*

9333. Robertson, W. A. **Oil from the fruit of Carapa moluccensis and C. obovata.** Indian Forest. **51**: 199–200. 1925.—Experiments show that only 1–2% oil can be extracted from the seed instead of 40–60% as indicated by Wijs.—*E. N. Munns.*

9334. Seddon, H. R. **Stachys arvensis: A cause of staggers or shivers in sheep.** Agric.

Gaz. New South Wales 36: 355–358. 1925.—It has previously been found that this disease may be caused when sheep are placed upon an exclusive diet either of *Malva parviflora* or *Lamium amplexicaule*. This article gives a summary of results showing that *Stachys arvensis*, when making up a nearly or quite exclusive diet of sheep, may also cause this disease, ending in death. That these plants have not been recognized as poisonous in their native localities is probably due to the fact that conditions are not such as to cause sheep to use them as an exclusive source of feed.—*L. R. Waldron.*

9335. Simonsen, John Lionel. **The constituents of some Indian Oils: Parts 14–15.** Indian Forest Rec. 11^1: 1–9. 1925.—The essential oils from the seed of *Zanthoxylum ovalifolium* and *Juniperus communis* are described.—*E. N. Munns.*

9336. Simonsen, John Lionel, and Madyar Gopal Rau. **Composition and uses of deodar oil.** (Abstract.) Indian Forest Rec. 9: 123. 1922.—Wood of deodar, *Cedrus deodara*, yield on distillation about 2.5 per cent. of oil. The authors confirm the finding of Roberts (*Trans. Chem. Soc. 109*; *791. 1916*) that the aromatic odor of the oil is due to p-methyl-tetrahydroacetophenone, a compound not previously found in nature. The oil also contains a sesquiterpene, an unidentified phenol, esters of hexoic, heptoic, stearic and butyric acids, and an unidentified free acid. It is suggested that it might be used in perfuming soap, and be found valuable as a timber preservative.—*L. A. Kenoyer.*

9337. Skarnitzl, Edward. **Japanischer Safran.** [**Japanese Saffron.**] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 48: 213–217. *Fig. 1–2.* 1924.—Material purporting to be Japanese saffron (*Crocus japonicus*) consisted of contorted thread-like elements 15–20 mm. long when dry, 25–30 mm. when wet, dark-red and lusterless, becoming dull brick-red on thorough drying, with a disagreeable peculiar odor reminiscent of herring-brine or algae. A given weight of this product occupied only ⅔ the volume of the same weight of true saffron [*Crocus sativus*]. It proved to consist of artificially colored flowers of Scotch thistle (*Onopordon Acanthium* L) weighted with barium sulphate and sand. The product is fully described and the characteristic thickened trichomes and bristle-hairs are figured.—*E. E. Stanford.*

9338. White, C. T. **The native bryony (Bryonia laciniosa).** Queensland Agric. Jour. 22: 442–444. *Pl. 148.* 1924.—The botanical characters and poisonous properties of the species are outlined.—*W. D. Francis.*

9339. White, C. T. **Vinca rosea—a reputed cure for diabetes.** Queensland Agric. Jour. Jour. 23: 143–144. *Pl. 26.* 1925.—The distribution of the species and directions for preparing it for consumption are given.—*W. D. Francis.*

9340. Whittet, J. N. **Impure Sudan grass and its effects on livestock. Young sorghum and sorghum-Sudan hybrids cause poisoning.** Agric. Gaz. New South Wales 36: 266–268. *6 fig.* 1925.—In certain instances markedly fatal results to cattle were noted when pastured upon Sudan grass containing admixtures of young sorghum and sorghum-Sudan hybrid plants. A chemical examination showed the presence of the prussic acid producing glucoside.—*L. R. Waldron.*

9341. Woodcock, E. F. **Observations on the poisonous plants of Michigan.** Amer. Jour. Bot. 12: 116–131. 1925.—A list of 156 poisonous pteridophytes and seed plants is presented, together with a brief statement of their poisonous properties.—*E. W. Sinnott.*

PHYSIOLOGY

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(See also in this issue Entries 8288, 8293, 8357, 8432, 8436, 8437, 8440, 8445, 8447, 8463, 8467, 8521, 8533, 8542, 8633, 8671, 8672, 8767, 8920, 8926, 8930, 8931, 8934, 8935, 8936, 8944, 9005, 9031, 9034, 9042, 9057, 9113, 9128, 9130, 9133, 9149, 9160, 9244, 9248, 9273, 9280)

GENERAL

9342. Abderhalden, E. **Einige Gedanken über die zentrale Stellung der Kohlenhydrate in der Organismenwelt.** [**Some thoughts on the central position of carbohydrates in the organic world.** Biochem. Zeitschr. 156: 51–53. 1925.

9343. Nicolas, G. **Revue des travaux de physiologie végétale parus de 1910 à 1919. [Review of the work in plant physiology appearing from 1910 to 1919.]** Rev. Gén. Bot. **37:** 23–33. 1925.

PROTOPLASM, MOTILITY

9344. Gray, J. **The mechanism of ciliary movement. III. The effect of temperature.** Proc. Roy. Soc. London B **95:** 6–15. *Fig. 1–2.* 1923.

9345. Kaho, H. **Über die Beeinflussung der Hitzekoagulation des Pflanzenplasmas durch die Salze der Erdalkalien. VI. [The action of earth alkali salts on the heat coagulation of plant protoplasm.]** Biochem. Zeitschr. **151:** 102–111. *2 fig.* 1924.—Anions of earth alkali salts lowered the coagulation temperature of the protoplasm of the cells of the upper epidermis of the crown leaves of *Viola tricolor* and of the lower epidermis of leaves from *Zebrina pendula.* Activity for Ca salts was CNS>nitrate>bromide>chloride>acetate; for Ba salts—CNS>bromide>chloride; for Sr salts—bromide>nitrate>chloride; for Mg salts—bromide>nitrate>sulphate>chloride>acetate. The differences are attributed to rates of "permeability."—*H. D. Hooker.*

DIFFUSION, PERMEABILITY, PHYSICO-CHEMICAL PHENOMENA

9346. Fujita, A. **Untersuchungen über elektrische Erscheinungen und Ionendurchlässigkeit von Membranen. I. Die Potentialdifferenz an der Apfelschale. [Electrical phenomena and ion permeability of membranes. The potential difference of apple cuticle.]** Biochem. Zeitschr. **158:** 11–27. 1925.—The difference in potential between salt solution filling a hole in an apple and salt solution in which the apple rested was measured electrometrically. The difference in potential varied for different apples but for the same apple depended on the nature and concentration of the dissolved electrolytes. An observed concentration effect was greater for monovalent than for polyvalent cations, and did not involve anions. For constant concentrations, the cations could be arranged in order of valence, there being little difference between monovalent cations. Treatment with ether, formaldehyde, and sublimate did not change the potential difference and boiling reduced it only slightly.—*H. D. Hooker.*

9347. Hammarsten, E. **Zur Frage über den osmotischen Druck der hochmolaren Elektrolyte. [The osmotic pressure of electrolytes of large molecular weight.]** Biochem. Zeitschr. **151:** 177–180. *2 fig.* 1924.—Freezing point determinations were made on egg white in HCl solutions. The observed depression was much less than the calculated, the difference increasing as acidity was increased below the isoelectric point.—*H. D. Hooker.*

9348. Hoagland, D. R., and A. R. Davis. **Suggestions concerning the absorption of ions by plants.** New Phytol. **24:** 99–111. 1925.—The nature of the phenomena involved in the penetration of substances into living plant cells is discussed. The recent literature of the field of the absorption of ions by plants is critically commented upon.—*I. F. Lewis.*

9349. Lundegardh, H., and V. Morávek. **Untersuchungen über die Salzaufnahme der Pflanzen. I. Die gegenseitige Beeinflussung der Ionen. [Salt absorption by plants. Antagonism.]** Biochem. Zeitschr. **151:** 296–309. *3 fig.* 1924.—Both cations and anions of neutral salts in concentrations of N/400 to N/100 affected the absorption of N/50 solutions of K, NO_3 and PO_4. The action of K, Ca, Mn, Al, NO_3 and PO_4 ions depended on lyotropic properties. Colloid phenomena failed to account for the action of other ions. The action of ions was powerfully affected by concentration. Absorption was measured by the change in composition of solutions in which Bohemian wheat seedlings were grown.—*H. D. Hooker.*

9350. Marx, Th. **Beitrage zur Koagulation des Milchsaftes von Manihot Glaziovii. [Coagulation of latex in Manihot Glaziovii.]** Tropenpflanzer **24:** 74–81. *1 fig.* 1924.—Plantation owners near the coast prefer sea water for preparing coagulation liquids. It has often been stated that caoutchouc treated with sea water does not dry well. The writer experimented with sea water from the coast of Tanga. In tabular forms he demonstrates the success or failure when the water is mixed with hydroxides, acids, salts, etc. Useful coagulants were: 1% acetic acid, 1% carbolic acid, 1% ort. cresol, 2% calcium hydroxide; of questionable value were 1% calcium hydroxide and 1% calcium chloride, 1.5% calcium hydroxide with

0.5% chlor calcium chloride, 5% magnesium chloride, 3% superphosphate, 3% ammonium sulphate and 1% zinc sulphate.—*J. C. Th. Uphof.*

9351. Michaelis, L., and A. Fujita. **Untersuchungen über elektrische Erscheinungen und Ionendurchlässigkeit von Membranen. II. Die Permeabilität von Apfelschale. [Electrical phenomena and ion permeability of membranes. The permeability of apple cuticle.]** Biochem. Zeitschr. **158:** 28–37. 1925.—Potassium did not escape from an apple with intact skin lying for 2 weeks in pure water. When lying in a solution of a Na salt, the Na was slowly replaced by K. Apple cuticle was permeable to cations but impermeable to anions.—*H. D. Hooker.*

9352. Pearsall, W. H., and J. Ewing. **The diffusion of ions from living plant tissues in relation to protein iso-electric points.** New Phytol. 23: 193–206. *1 fig.* 1924.—Cylinders of potato tuber and carrot root-tissue were placed in unbuffered solutions of HCl and NaOH whose Cl′ concentration was not more than 0.008 N; in some series the Cl′ concentration was kept uniform by the addition of NaCl. Outward diffusion of Cl′ was measured by titration of the external solution. The Cl′ diffusion gradient was always in the direction tissue > solution and had little effect on the rate of outward diffusion of Cl′, which was small when the external solution was less acid than pH 4.3–4.4 but was greatly increased when the solution was more acid. Solutions which remained more acid than this pH killed the potato tissue. Since the known isoelectric points of the principal proteins (globulins) of these plants are also about pH 4.3 the authors suggest that the outward diffusion of ions is due to precipitation or related changes in these proteins. Dissociation of preëxisting protein chlorides is considered improbable since the Cl′ in tissue extracts is already largely dissociated. Experiments on the outward diffusion of pigment from beet tissue and the work of Hoagland and Davis on the diffusion of Cl′ from *Nitella* show a similar relation to pH. It is suggested that the method may be used to determine the isoelectric points of other plant proteins.—*M. M. Brooks.*

9353. Sakurei, K. **Über die Absetzgeschwindigkeit von Emulsionen, wie Milch, Blut usw. und Pflanzenmilchsaften. [The rate of separation of emulsions such as milk, blood and plant latex.]** Biochem. Zeitschr. **149:** 525–533. 1924.—The addition of a small amount of NH_3 and of a sol prepared from Carraghan or Iceland moss causes emulsions of milk or rubber latex to separate into 2 layers.—*H. D. Hooker.*

9354. Scarth, G. W. **The penetration of cations into living protoplasm.** Amer. Jour. Bot. **12:** 133–148. *Fig. 1–3.* 1925.—A reaction in the cells of *Spirogyra,* which is shown to require penetration of the stimulating agent, is used as a criterion of the penetration capacity of cations. Penetration of many divalent and trivalent cations is rapid first but soon slows down, apparently to a standstill. The curve obtained when initial penetration is plotted against external concentration of first rises steeply and then flattens out or even falls away in successively higher concentrations. The penetrability of an ion is determined by 2 distinct and opposing reactions of the cell, one tending to active absorption of the ion, the other to its exclusion. The latter takes some time to reach its full power, in which interval the former displays its maximum but gradually decreasing activity. The sensitiveness of both reactions increases with the valency of the cation; the former, but not the latter, is markedly affected by other properties. The factor of active absorption increases greatly with the atomic weight of the cation in any particular chemical group. It also increases inversely with solution pressure, but only at the heavy-metal end of the solution-pressure series. The order of initial penetrability of ions is mainly that of their general physiological activity, so that active absorption is apparently a "vital function." The mechanism of the self-antagonizing action of ions appears to be identical with that of the antagonism between ions, or at least with 1 type of such antagonism. Depending simply on the colloidal activity of the ion, it has probably a simpler mechanism than the absorption factor. The seat of it appears to be the lipoid exterior of the protoplasm, since leaching of these lipoids (Hansteen-Cranner) reduces the capacity of the cell to react to antagonistic action of ions.—*Authors' summary.*

9355. Schaefer, R., and F. Schmidt. **Über kolloide Eigenchaften des Phlorrhizins. [The colloidal properties of phlorrhizin.]** Biochem. Zeitschr. **149:** 585–591. 1924.—Phlorrhizin diffused slowly in a gelatine gel, failed to lower the freezing point of solutions and showed low electrical conductivity. Acids and alkalis did not alter its dissociation. Its particles are probably smaller than 10$\mu\mu$. Colloidal particles were visible in an ultramiscroscope and dilute solutions gave a Tyndall effect.—*H. D. Hooker.*

9356. Skene, Macgregor, and Gladys L. Stuart. **Acidity produced in salt solutions by Sphagnum.** Nature **115**: 605–606. 1925.—This is a brief report upon experiments with different Na salts which gave pH values: Cl 4.6, SO_4 4.6, acetate 5.5, citrate 5.9, borate 9.4 —*O. A. Stevens.*

9357. Tomita, T. **Adsorption und Osmose in Gelen. [Adsorption and osmosis in gels.]** Biochem. Zeitschr. **153**: 335–357. *2 fig.* 1924.—Swelling, adsorption and osmosis were measured in aqueous gels of gelatin, egg white, agar, sodium cholate and silicic acid after treatment with aqueous solutions of substances having surface activity. Such compounds were sooner or later absorbed completely by the gels. Acetic and butyric acid penetrated the gels with equal rapidity, showing that surface activity is of no significance in this case. When lecithin was added to gelatin and egg white, comparison with gels lacking lecithin showed that acetic acid, urethan and butyric acid penetrated the gel exclusively by way of the water path, while substances with greater surface activity and greater lipoid solubility such as octyl alcohol and caprylic acid, penetrated both by the water path and the lipoid path. Experiments with gelatin or albumen gels and mixed solutions of acetic or butyric acid with colloids such as peptone, albumin and acid dyes showed that a membrane was formed at the surface, probably as the result of the opposite electric charges. These membranes were semipermeable, allowing the fatty acids to penetrate the gels but stopping water absorption and swelling.—*H. D. Hooker.*

9358. Traube, J. **Lipoidtheorie und Oberflächenaktivitätstheorie. [The lipoid theory and the surface activity theory.]** Biochem. Zeitschr. **153**: 358–361. 1924.—An attempt is made to reconcile the lipoid theory of absorption with the surface activity theory on the basis of Tomita's work. If the water path is alone available, water-soluble substances penetrate easily and surface-active compounds, though adsorbed at the surface, also eventually penetrate the gel. There is no relation between rate of absorption and surface activity. If a lipoid path is also available, as in living cells, the surface active substance penetrates the gel by the lipoid path, and there is a definite relation between osmosis and lipoid solubility.—*H. D. Hooker.*

9359. Traube, J., and S. Yumikura. **Lipoidtheorie und Oberflächenaktivitätstheorie. II. [The lipoid and the surface activity theories.]** Biochem. Zeitschr. **157**: 383–387. 1925.—Lipoid solubility and surface activity run parallel, hence substances penetrate living cells faster and in greater amounts the more lipoid soluble they are. The lipoid and the surface activity theories of absorption, therefore, do not conflict.—*H. D. Hooker.*

9360. Yumikura, S. **Osmose einiger Anästhetika in wässerge und lipoidhaltige Gele. [Osmosis of anaesthetics in aqueous and lipoid containing gels.]** Biochem. Zeitschr. **157**: 359–370. *10 fig.* 1925.—The relative penetration of water and various cocaine alkaloids or their salts into gels with and without lecithin was measured, as well as their distribution at equilibrium. Alypine and eucaine penetrated lipoid-free gels most rapidly, but cocaine penetrated most rapidly when lecithin was present in the gel. The relative toxicity of these alkaloids is thought to depend on the lipoid content of the exposed cells.—*H. D. Hooker.*

9361. Yumikura, S. **Osmose in wässerigem Gel ohne und mit Lipoidzusatz. [Osmosis into an aqueous gel with and without lipoid.]** Biochem. Zeitschr. **157**: 371–376. 1925.—Caprylic acid and octyl alcohol penetrated aqueous gels of gelatin and egg white completely in 24 hours when lipoids were abundant. Butyric acid and amyl alcohol which have less surface activity likewise penetrated the lipoid-containing gels, but not completely. The diffusion velocities of butyric and acetic acid in penetrating lecithin-free and lecithin-containing gels were equal at first, but that of acetic acid gradually increased.—*H. D. Hooker.*

9362. Yumikura, S. **Über Osmose einiger Säuren in ein Gelatinegel. [Osmosis of acids into a gelatin gel.]** Biochem. Zeitschr. **157**: 377–382. 1925.—The diffusion velocities of acids into gelatin gels were in the order: hydrochloric>sulphuric>formic>lactic.—*H. D. Hooker.*

WATER RELATIONS

9363. [Aleksandrov, V. G.] Алекандров, В. Г. **Водный Режим листвы Мезосрита. [The water regime of the foliage of a mesophyte.]** Вестник Тисрлисского Ботанического Сада Новая Серия. [Monitor Tiflis Bot. Gard. n. s.] **1:** 57–72. 1922–1923.—The author compared the intensity of transpiration of different leaves on the same stem of various plants, particularly of the sunflower. From his results he concludes that the foliage of anherbaceous mesophyte could be expressed as a coordinating system consisting of 2 types of homologous organs, which differ not only in the details of their structure but also in their ability to give off water under similar internal conditions. When the supply of water is adequate, the upper leaves transpire more than the lower ones. When there is a water deficit, the reverse is true. He concludes that the upper leaves are therefore not only more xeromorphic but are also more xerophytic than the lower ones.—*L. J. Pessin.*

9364. Appleman, C. O., and W. D. Kinbrough. **Physiological shrinkage of potatoes.** Proc. 11th Ann. Meeting, Potato Assoc. America **1924:** 66, 67. 1925.—Previous methods of experimentation have not furnished reliable information on the effect of changing internal conditions as a factor in determining the rate of water loss from potatoes in storage due to difficulty in controlling all external conditions that influence the evaporation rate. The rate of water loss from tubers was compared to that from porous cup atmometers. Immature potatoes, dug when the skins slip easily, lost 20–30 times more water during the 1st week of storage than during any week a month later. Mature potatoes lost less than ½ as much water in the same period. Because of corking of the skins and possibly other internal changes, the rate of evaporation from the tubers decreases rapidly during the 1st month of storage. During the mid-storage period, water-loss is controlled almost entirely by external conditions, but in the late-storage period water-loss increases slightly. When sprouting begins, water-loss is further accelerated. Storage conditions most favorable for one period or the storage life of potatoes, may not be best for all other periods.—*J. T. Rosa.*

9365. Priestley, J. H., and A. Wormall. **On the solutes exuded by root pressure from vines.** New Phytol. **24:** 24–38. *Fig. 1.* 1925.—After a discussion of the scanty data bearing on the chemical nature of root pressure exudates, methods are described by which large quantities of vine (*Vitis*) sap were collected under sterile conditions. The results of chemical analysis of 90,300 cc. of sap are given in a table. Among the striking results are the low concentration of the sap, the presence of several dibasic organic acids practically to the exclusion of any other type, the absence of all but traces of organic N, and the presence of diastase and peroxidase.—*I. F. Lewis.*

9366. Rhine, J. B. **Clogging of stomata of conifers in relation to smoke injury and distribution.** Bot. Gaz. **78:** 226–231. 1924.—A study of the internal physiological condition of needles of the Austrian pine and other conifers resulting from clogging of the stomata by soot indicates that the black deposit in the stomatal pits is a natural product of the leaf. It is a finely granular waxy substance, permeable to gases, and apparently retards gas exchange. The presence of the wax is apparently correlated with the xerophytic character of the conifers.—*L. J. Pessin.*

MINERAL NUTRIENTS AND SALT RELATIONS

9367. Barnette, R. M. **The influence of soluble aluminum salts on the growth of wheat seedlings in Shive's R_3C_3 solution.** New Jersey Agric. Exp. Sta. Ann. Rept. **44:** 255–258. 1923. [1924].—Wheat seedlings were grown in Shive's solution R_3C_3 for a period of 3 weeks under the influence of varying concentrations of soluble Al in the form of NO_3, SO_4 and Cl. The concentrations employed varied from 0.01 mgm. to 10 mgm. per l. of solution. The low concentrations of Al salts had very little if any effect on the growth of the tops. With a single exception, concentrations above 0.1 mgm. caused a decided decrease in the dry weights of tops, roots and total yields; 10 mgm. of aluminum reduced the total yields 55.9%. Increasing the concentration of Al salts caused slight but progressive increases in the H-ion concentrations of the solutions. The increase, however, was not sufficiently large to account for the toxic effects on plant growth.—*Wm. H. Martin.*

9368. Cook, F. C. **The influence of copper sprays on the yield and composition of Irish potato tubers.** U. S. Dept. Agric. Bull. 1146. *1–26.* 1923.—Analyzed when about 1 inch in diameter, tubers from cu-sprayed plants were usually higher in solids, starch and N than those from unsprayed plants. Starch increased about 50% as the tubers matured; the dextrose disappeared and the sucrose was greatly reduced. In early varieties, sugar decreased as starch increased in Cu-sprayed tubers during early stages of growth. The proportion of insoluble ash decreased during growth of tubers, though total ash remained constant; total N increased. Soluble, coagulable, and particularly monoamino and amid N increased as the tubers matured. The proportion of tubers to green vines was apparently higher for Cu-sprayed plants.—The food value of an acre of Cu-sprayed potatoes averaged 839 pounds more than that of those not so sprayed, 2 factors, increased yield and increase of solids, being here involved. A 10–10–50 Bordeaux mixture seemed to have no advantage over the 5–5–50 formula and may possibly give too much Cu for the maximum stimulative or protective effects. At Arlington Experimental Farm, Virginia, a lime spray (no Cu) gave decreased tuber yields. Pickering's limewater and a Ba-water spray gave about the same increase in yield and in solids as a Bordeaux spray. The Cu in the spray is the essential factor.—A literature list of 52 entries is included.—*Frederick V. Rand.*

9369. Duchon, Fr. **Beitrag zur Erklärung der ertragssteigernden Wirkung der kolloidalen Kieselsäure bei unzureichender Phosphorsäuredüngung in Sandkulturen. [The increase in yield due to colloidal silicic acid in sand cultures insufficiently fertilized with phosphoric acid.]** Zeitschr. Pflanzenernähr. u. Düngung 4: 316–325. 1925.—The favorable action depends chiefly upon the physical properties of the colloid which improves the unfavorable physical properties of the sand.—*F. M. Schertz.*

9370. Fellenberg, T. v., and H. Geilinger. **Untersuchungen über das Vorkommen von Jod in der Natur. IX. Über Jodabspaltung und Jodspeicherung durch Mikroorganismen. [The natural occurrence of iodine. Release and storage of iodine by microorganisms.]** Biochem. Zeitschr. **152:** 185–190. 1924.—Iodine was liberated from iodides in dilute acid or alkaline solutions. Bacteria or molds when present passively combined with the liberated I. In neutral iodide solution *Aspergillus niger* absorbed no I.—*H. D. Hooker.*

9371. Kusnetzov, S. J. **Die Bedeutung des Calciums für die Gattung Citromyces. [The significance of calcium for the genus Citromyces.]** Biochem. Zeitschr. **157:** 339–349. 1925.—*Citromyces glaber* in sucrose-KNO_3 culture grew best at pH 5.5. The upper limit for development was pH 8.7. In alkaline solution the spores germinated below the surface of the liquid. $(NH_4)_2SO_4$ was the best source of N. KNO_3 was nearly as good. In cultures containing $CaCO_3$, an increase in NH_4NO_3 supply decreased citric acid production and favored growth. In neutral or weakly alkaline solution, Ca ions decreased citric acid production and also growth. Soluble Mg salts antagonized this action of Ca. In acid solution, Ca had no effect Sterilization of the nutrient medium with or without $CaCO_3$ made a marked difference. NO_3 was absorbed more readily in acid solution than in alkaline, NH_3 more readily in alkaline solution.—*H. D. Hooker.*

9372. Lemmermann, O. **Bemerkungen zu der vorstehenden Arbeit von Fr. Duchon "Beitrag zur Erklärung der ertragssteigernden Wirkung der Kolloidalen Kieselsäure bei unzureichender Phosphorsäuredüngung in Sandkulturen." [Remarks on the work of Fr. Duchon regarding "The increase in yield due to colloidal silicic acid in sand cultures insufficiently fertilized with phosphoric acid."]** Zeitschr. Pflanzenernähr. u. Düngung 4: 326–330. 1925.

9373. Lemmermann, O., H. Wiessmann, and K. Sammet. **Untersuchungen über die Ursache der ertragssteigernden Wirkung der Kieselsäure. [Investigation on the cause of increased yields due to silicic acid.]** Zeitschr. Pflanzenernähr. u. Düngung 4: 265–315. 1925. —The extensive report includes 25 tables.—*F. M. Schertz.*

9374. Lesage, Pierre. **Sur les fruits anormaux et l'entrainement à la résistance à la salure dans le Lepidium sativum. [Abnormal fruits and the development of resistance to salt in Lepidium sativum.]** Rev. Gén. Bot. 35: 209–212. 1923.—Salted plants have a smaller weight, the seed are less numerous, lighter and shorter than in the control plants. The characters resulting from salting persist to some extent in non-salted descendants. Abnormal fruit were found among the salted plants and chiefly in salted plants from seed of abnormal fruit. The salted plants acquire a certain resistance to the salting.—*J. C. Gilman.*

9375. Lomanitz, S. **Notes on the influence of sodium chloride on the growth of alfalfa in solution cultures.** New Jersey Agric. Exp. Sta. Ann. Rept. **44:** 243–246. 1923 [1924].—Alfalfa was grown in Tottingham's solution T_1 R_1 C_5 and in 4 other solutions containing NaCl in amounts varying by increments of 0.1 atmosphere osmotic concentration, the total osmotic concentration of each solution being approximately 1 atmosphere. In every case but 1 the solutions receiving the NaCl gave growth increases over the checks. The greatest relative increase was found in the roots. Where 0.1 atmosphere osmotic concentration of NaCl replaced an equivalent amount of KNO_3 the average yield value was 158.7, with the checks at 100. This solution also gave greatest increase of top growth. The N content of the plants from the different cultures did not vary greatly, while there was a uniform increase in Cl content with an increase in percentage of NaCl in the culture solutions.—*Wm. H. Martin.*

9376. Marsh, Robert P. **Ferric glycero phosphate and soluble ferric phosphate as sources of iron for soybean plants in solution culture.** New Jersey Agric. Exp. Sta. Ann. Rept. **44:** 247–252. 1923. [1924].—The author reports the results of a study of the influence on small amounts of these 2 forms of iron upon the growth of soybean plants in 7 nutrient solutions containing varying partial concentrations of $(NH_4)_2SO_4$. The solutions used were based on the Tottingham solution with $(NH_4)_2SO_4$ substituted for the KNO_3 in equivalent osmotic concentrations, the concentration of the salt varying by intervals of 0.05 atmosphere from an osmotic concentration value of 0.05 atmosphere to 0.35 atmosphere. All of the solutions had a calculated total osmotic concentration value of 1 atmosphere. The Fe solutions were added to the culture solutions to supply 0.1 mgm. of Fe per l., while the plants were young and 0.2 mgm. when the plants were older. Constant renewal of the solutions and aeration were provided. Soluble ferric phosphate proved to be very toxic in all of the cultures, whereas Fe supplied in the same concentration in the form of ferric glycero phosphate produced excellent plants. This is believed to be due to the fact that the latter material has a lower availability in these solutions than has the former material, so that the amount of Fe required to maintain the plants in a healthy condition when supplied by ferric glycero phosphate becomes quite toxic when supplied by the soluble ferric phosphate. Both series showed a decided decrease in yield with an increase in the amount of $(NH_4)_2SO_4$ supplied to the solutions.—*Wm. H. Martin.*

9377. Marsh, Robert P. **Iron solubility tests in culture solutions at different pH values.** New Jersey Agric. Exp. Sta. Ann. Rept. **44:** 252–255. 1923. [1924].—This study was conducted to determine the solubility of ferric glycero phosphate, soluble ferric phosphate, ferric tartrate and ferrous sulphate, in the Tottingham solution T_1 R_1 C_5, the Shive solution R_2S, and a modified Tottingham solution. Each of the solutions was adjusted to pH values of 4.6, 5.5 and 6.2 by the addition of 0.5N KOH. The various forms of Fe were added at the rate of 4 mgm. per l. of solution. After the prepared solutions had stood for 3 days the filtrate and precipitate were analyzed for their Fe content by means of the Wolter method. Ferric glycero phosphate in all 3 types of solutions showed higher solutility at pH 5.5 than at either a higher or lower pH value. At a pH 6.2, soluble ferric phosphate proved to be practically insoluble, at the other pH values it showed a relatively high solubility. Ferric tartrate showed a relatively high solubility in each of the 3 types of solutions used and at the different pH values. Ferrous sulphate was insoluble at pH values of 6.2 but showed relatively high solubility at the other pH values.—*Wm. H. Martin.*

9378. Richards, Oscar W. **The effect of calcium sulphate on the growth and fermentation of yeast.** Jour. Amer. Chem. Soc. **47:** 1671–1676. 1925.—*Saccharomyces cerevisiae* grows best and ferments most efficiently at a Ca concentration of 0.0001 M.—*J. M. Brannon.*

9379. Smirnow, A. J., and S. P. Alissowa. **Zur Frage über die Rolle der Aschenbestandteile in der Pflanzen. I. Das Einwirkung von Neutralsalzen auf die Katalase. [The role of ash constituents in plants. The effect of neutral salts on catalase.]** Biochem. Zeitschr. **149:** 63–78. *3 fig.* 1924.—Water extracts of wheat grain had buffer action, presumably due to the presence of phosphates and salts of organic acids. The reaction of the extract was not affected by monobasic chlorides. Dibasic chlorides lowered the pH 0.2–0.6. Catalase activity ranged from 4.76 at pH 3.5 to 135.98 at pH 7.3. Salts lowered the pH from 6.7 to 6.2, $MnCl_2$ alone lowering it to 5.9. Catalase activity was reduced by cations, bivalent cations producing double the reduction of monovalent cations. Mn induced even greater reduction. The action of anions was independent of valence. Retardation of catalase activity was in the order $SO_4 < PO_4 < Cl < NO_3$. Salts of monovalent cations retarded catalase activity in M/320 solution; those of divalent cations in M/640 solution. Further dilution showed a zone of inactivity followed by a 2nd zone when catalase activity was weakly retarded.—*H. D. Hooker.*

9380. Smirnow, A. J. **Zur Frage über die Rolle der Aschenbestandteile in den Pflanzen. II. Das Einwirken von Neutralsalzen auf die Peroxydase. [The role of ash constituents in plants. The action of neutral salts on peroxidase.]** Biochem. Zeitschr. **155**: 1–33. 4 *fig.* 1925.—The action of neutral salts on the activity of peroxidase in aqueous wheat extracts was measured by the oxidation of pyrogallol to purpurogallin. Peroxidase activity began at pH 3.5 and reached a maximum at pH 8.8, decreasing rapidly above this point. Kations had the more marked effect. Peroxidase activity was increased by Ca, Sr, and Ba at great dilution. Mg retarded peroxidase activity at low concentrations, increased it at high. Zn and Hg retarded, Li at high concentrations stimulated and the other alkali chlorides had slight effect. Two salts acting in the same sense were additive in effect; if their action is contrary, that of the stronger predominates. Mn retarded peroxidase activity the more, the lower its concentration. Inactivated extract was activated by Zn, Mn, and Fe. Iron tartrate increased peroxidase activity less than the earth alkalies. Anions had slight effect, acting only in high concentrations.—*H. D. Hooker.*

PHOTOSYNTHESIS

9381. Galivialo, M. J. **Zur Frage nach der Photosynthese der Kohlehydrate. [Carbohydrate photosynthesis.]** Biochem. Zeitschr. **158**: 65–75. *1 fig.* 1925.—No formaldehyde or carbohydrate synthesis occurred in distilled water saturated with CO_2 and exposed to sunlight, but traces of formaldehyde appeared in tap water so treated. An enzyme was extracted from maize, pea, turkey bean, potato and birch leaves, and electolytes were extracted from the root fibres of the same plants. When united and added to water saturated with CO_2, sugar formed on exposure to sunlight. When used separately neither leaf nor root extract induced sugar or HCHO formation. After sugar synthesis, the sugar disappeared after 4 days' exposure to sunlight. Evaporation to dryness left a residue of round grains that gave a deep blue color with I.—*H. D. Hooker.*

9382. Lundegardh, H. **Der Temperaturfaktor bei Kohlensäureassimilation und Atmung. [The temperature factor in carbon assimilation and respiration.]** Biochem. Zeitschr. **154**: 195–234. *11 fig.* 1924.—Experiments with leaves of *Solanum tuberosum*, *S. lycopersicum*, and *Cucumis sativus* at different temperatures and light intensities showed by volumetric gas analyses that respiration follows van't Hoff's law. No time factor was evident so long as the leaves were uninjured by the higher temperatures. Injury could not be avoided above 50°C. The optimum temperature for carbon assimilation was 30° for potato leaves, 35.5° for tomato, and 36–37° for cucumber. A time factor was evident in the assimilation of cucumber leaves but not of tomato or potato leaves. An optimum curve was obtained when light or CO_2 were in minimum. The optimum is defined as the point at which retardation begins.—*H. D. Hooker.*

9383. Parkin, John. **The first sugar of photosynthesis and the rôle of cane sugar in the plant. A reply to Professor J. H. Priestley.** New Phytol. **24**: 57–64. 1925.—Priestley's suggestion (New Phytol. **23**: 264, 1924) that differentiating meristem is the usual source of cane sugar does not explain the cane sugar present in the foliage leaf. The bulk of the hexose sugars in the leaf is believed to come from sucrose by inversion. Further discussion includes the origin of cane sugar elsewhere than in green tissue and its distribution in the plant kingdom.—*I. F. Lewis.*

9384. Priestley, J. H. **The first sugar of photosynthesis and the rôle of cane sugar in the plant.** New Phytol. **23**: 255–265. 1924.—From a survey of the literature it is concluded that hexoses are formed as the primary photosynthetic sugars. Cane sugar may not be directly connected with the synthesis or hydrolysis of starch or with storage phenomena, but would appear as a secondary product in the metabolism of the meristematic protoplast, being occasionally released as the cells vacuolate and differentiate.—*I. F. Lewis.*

9385. Schertz, F. M. **The quantitative determination of xanthophyll by means of the spectrophotometer and the colorimeter.** Jour. Agric. Res. 30: 253-261. *Fig. 1-5.* 1925.—Graphs are given for various concentrations of xanthophyll in comparison with Lovibond slides 5, 10, and 20, yellow. From these graphs the amount of xanthophyll in a solution may be determined. The transmittancy of xanthophyll in ether has been determined for the Hg line 435.8 μ and a graph has been drawn from which it is possible to determine very accurately the amount of xanthophyll in an ether solution. The specific transmissive index for xanthophyll in ether solution is 2.089, while that for carotin was found to be 1.986. Data are submitted which show that the spectrophotometer is accurate to 10 parts in 354, or 2.8% while the colorimeter is accurate to 61 parts in 358, or 17%. A graph has been made showing the relative position of the edge of the absorption band (1) for carotin and for xanthophyll. These may be used to ascertain whether a solution contains carotin or xanthophyll after the concentration has been determined.—*Author.*

9386. Yabusoe, M. **Über den Temperaturkoeffizienten der Kohlensäureassimilation. II. Über die Blackmansche Reaktion. [The temperature coefficient of carbon assimilation. Blackman's reaction.]** Biochem. Zeitschr. 152: 498-503. *3 fig.* 1924.—The dark reaction that limits C assimilation under intense illumination (Blackman's reaction) was found to be a linear function of temperature between 10° and 30°C. *Chlorella* was used in Knop's solution saturated with a gas mixture of 5% CO_2, 2% O_2 and 93% N_2. Thin layers were illuminated at an intensity such that an increase did not accelerate assimilation. Decomposition of H_2O_2 in the dark by *Chlorella* was also a linear function of temperature between 10° and 30°. Below 10° both assimilation and H_2O_2 cleavage deviated from the linear relation. This suggests that Blackman's reaction may be a peroxide cleavage. The respiration of *Chlorella*, of avian red blood cells, the respiration and fermentation of yeast, fermentation by lactic acid bacteria, glycolysis by carcinoma cells and leucine oxidation do not have a linear temperature function.—*H. D. Hooker.*

METABOLISM (GENERAL)

9387. Armstrong, C. F. **Modifications of the Bach process of making white sugar.** Internat. Sugar Jour. 27: 187-189. 1925.—Details are given of the successful procedure to overcome turbidity in molasses, one of the disadvantages of the Bach process, and of the modifications of the process to improve the color of the liquor, together with a brief review and analysis of the claims made for the direct carbon process, and a rough comparison of the chemical costs of the modifications of the Bach process and a straight vegetable carbon process. Contrary to the opinion of some chemists that carbons are useless where mineral acids are present, the author found that most of the vegetable carbons with which he experimented function better when mineral acids are present.—*Nellie E. Fealy.*

9388. Bertrand, Gabriel. **Rectification au Mémoire de M. P. Thomas sur une nouvelle reaction des pentoses. [Correction of the paper of P. Thomas on a new reaction of pentoses.]** Bull. Soc. Chim. Biol. 7: 436-439. 1925.—Thomas (see Bot. Absts. 14, Entry 7481) is in error in ascribing discovery of the value of orcine as a reagent for differentiating between various reducing sugars to Allen and Tollens. The paper of these authors cited by Thomas mentions orcine only as a test for pentoses. Bertrand claims priority for the discovery, in 1891, that orcine may be used for differentiating between various hexoses.—*Joseph S. Caldwell.*

9389. Blagowestschenski, A. **Untersuchungen über die Samenreifung. [The ripening of seed.]** Biochem. Zeitschr. 157: 201-219. 1925.—The changes in the water, ash, ether extract, total N, protein N, reducing sugar, sucrose, polysaccharide, starch and hemicellulose content of *Vicia faba minor* seed were followed during the process of ripening. The peptase and amylase content of the ripening seed was also measured.—*H. D. Hooker.*

9390. Colin, H. **Formation et distribution de l'inuline dans la tige de topinambour. [Formation and distribution of inulin in the stalk of artichoke.]** Rev. Gén. Bot. 37: 97-101.

1925.—It is affirmed that in the stalk of the artichoke inulin is transported in the deep as well as in the superficial parts. At its base the stalk ends in a kind of bulb, succulent in its center, where the materials from the top accumulate transitorily and whence arise the stolons that become swollen into tubercles. Inulin invades the roots equally and is found also localized in the ligneous tissue. It is scarcely probable, therefore, to consider the phloem as the only place where inulin is formed. The sugars delivered by the leaves, and formed of a dextrogyrose mixture of saccharose, glucose and levulose, traverse the cortex and, crossing by the medullary rays, penetrate the central cylinder. That part which is not used on the way is condensed. Therefore, during the active period the proportion of inulin increases from the top of the stalk to the base, while the reducing sugars become progressively less.—*J. C. Gilman.*

9391. Deniges, Georges. **A propos de la reaction naphtolique des pentoses libres et combinés de M. Pierre Thomas. [Apropos of the naphthol reaction of free and combined pentose proposed by Pierre Thomas.]** Bull. Soc. Chim. Biol. **7**: 440–442. 1925.—Thomas (see Bot. Absts. 14, Entry 7481) has cited a paper of Deniges published in 1915 in which the use of beta-naphthol as a reagent for pentoses is described. Deniges reproduces portions of a paper which he published in 1908, in which methods for employing alpha- and beta-naphthol for identifying and differentiating between fructose, glucose, mannose, galactose, rhamnose, xylose, and arabinose were fully described.—*Joseph S. Caldwell.*

9392. Dyer, W. J. **Continuous versus intermittent clarification in the cane sugar factory.** Internat. Sugar Jour. **27**: 207–209. 1925.—The opinion of many is that the difficulty of filtration of Hawaiian sugars, which has developed since about 1895, and of Philippine sugars compared with sugars imported from other parts of the world, has been brought about in Hawaii by the continuous clarification now universal there, and in the Philippines by its recently constructed centrals. Some historic and descriptive data are given of different methods of clarification, including the earlier method, which is the intermittent process of liming, heating, settling, and decanting or drawing off the individual tanks; the continuous clarification process; the Deming system of continuous heating and settling; and the Kopke system of centrifugal settling. The author believes that the intermittent process has not been excelled in practicability and efficiency by any clarifying system so far contrived. The continuous method, while desirable for economic reasons, has failed to reach the standard of the older process. The Kopke type of apparatus promises to reach this mark and in addition to dispense with the filter. The benefits of juice clarification by centrifuging are the brief period required for handling, the saving of heat, the entire elimination of filter presses and resettling tanks, 60 to 80% reduction in labor costs, and the small floor area required.—*Nellie E. Fealy.*

9393. Eyster, William H. **Inherited deficiency in carbohydrate metabolism in maize.** Bot. Gaz. **78**: 446–452. *Fig. 1–3.* 1924.—The author has described a type of chlorotic maize plant which is characterized by a deficiency in carbohydrate metabolism strikingly like the diabetic condition in animals. Maize plants with the type of chlorosis usually observed exhaust the reserve of the carbohydrate supply of the endosperm, languish and finally die because their inherited chlorophyll imperfections made it impossible for them to elaborate a new supply of carbohydrates. The new genetic type of maize described by the author digests and absorbs the endosperm but is unable to utilize the sugars thus obtained in the vital processes and consequently dies much earlier than the type of chlorotic plant usually observed. The word "glucostacty" is suggested to represent this type of deficiency in carbohydrate metabolism and the condition is inherited as a simple Mendelian recessive character.—*S. G. Lehman.*

9394. Farnell, R. G. W. **Hydrogen-ion concentration in cane-sugar factories.** Internat. Sugar Jour. **27**: 141–145. 1925.—The H-ion concentrations of solutions in a few defacation factories in the British West Indies, in Natal sulpho-defacation factories, in Mauritian sulpho-defacation factories, in a Natal carbonation factory, in a Natal sulphitation factory working the Bach process and in a defacation factory in Trinidad using this process on melted sugar liquor in a "refinery" attached to the raw-sugar factory, are given. The application of the colorimetric method of determining H-ion concentration and of the quinone and hydrogen electrodes to work in cane sugar factories are discussed.—*Nellie E. Fealy.*

9395. Fincke, Heinrich. Über die Bestimmung der Kakaorohfaser nach Weber und Bötticher. [Determination of crude fiber in cacao by the method of Weber and Bötticher.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel **48**: 442–445. *Pl. 2.* 1924.

9396. Fleury, Paul, et Paul Tavernier. Quelques observations sur le pouvoir réducteur du glucose vis-à-vis des sels du cuivre en milieu alcalin (liqueur de Fehling) et en milieu acide (reactif de Barfoed). [Observations on the reducing power of dextrose with respect to copper salts in an alkaline medium (Fehling's solution) and in an acid medium (Barfoed's reagent).] Bull. Soc. Chim. Biol. **7**: 331–335. 1925.—In an acid medium, a given quantity of dextrose reduces more Cu but the reaction proceeds more slowly than in an alkaline medium. Dilution of Barfoed's reagent very greatly decreases the reduction of Cu by a given amount of dextrose. The presence of chlorides or of mannite also decreases the reduction of Cu in acid media, but not in alkaline media. The chlorides and nitrates of Ca, Sr, and Ba depress the reduction in Fehling's solution. In alkaline media the base is responsible for the effect, in acid media the Cl is the active agent.—*Joseph S. Caldwell.*

9397. Gardner, Frank E. **A study of the conductive tissues in shoots of the Bartlett pear and the relationship of food movement to dominance of the apical buds.** California Agric. Exp. Sta. Tech. Paper **20**: 1–26. *Pl. 1–8.* 1925.—Shoots of the Bartlett pear were treated by bending, ringing and heading-back. The characteristic growth of the buds immediately below the ring, bend, or point of detachment was obtained. Defoliation, if done before August 1, also induced growth in the part defoliated. Studies of the conductive tissues were made, showing the distribution of starch and sugars, and the role of each tissue in the conduction of food and water. Results indicate that in the pear, the phloem is the tissue largely concerned in the movement of foods; also that the food movement has a relationship to the dominance of the apical buds, in that the carbohydrate-nitrogen balance is involved. —*Margaret Buvens.*

9398. Gillot, Paul. **Extraction du maltose des organes de reserve de la mercuriale vivace. (Mercurialis perennis L.) [Isolation of maltose from the storage organs of Mercurialis perennis.]** Bull. Soc. Chim. Biol. **1**: 380–382. 1925.—An aqueous extract of the rhizomes and roots was fermented with *Saccharomyces Marxianus* for removal of reducing sugars and sucrose. Maltose was isolated from the residual liquid as the Ba salt and its identity established by the usual tests.—*Joseph S. Caldwell.*

9399. Goss, Harold. **The antiscorbutic value of commercially concentrated orange juice.** Hilgardia **1**: 15–34. *Pl. 1–14.* 1925.

9400. Griebel, C. **Acetaldehyd, ein normaler Bestandteil der als Inklusen bezeichneten gerbstoffreichen Zellinschlüsse im Mesokarp bestimmter Früchte. [Acetaldehyde, a normal constituent of the tanniniferous cell-inclusions known as "inklusen" in the mesocarp of certain fruits.]** Zeitschr. Untersuch. Nahrungs- u. Genussmittel **48**: 218–220. 1924.—Acetaldehyde is found in certain cell-inclusions of the fruit of *Pyrus domestica* Smith, *Ceratonia siliqua* L., *Mespilus germanica* L., *Pyrus communis* L., *P. torminalis* L., and *Cornus mas* L. The amount of acetaldehyde increases with over-ripeness.—*E. E. Stanford.*

9401. Griebel, C. **Einige Beobachtungen über den Reifungsprozess der Bananen. [Observations on the ripening process of bananas.]** Zeitschr. Untersuch. Nahrungs- u. Genussmittel **48**: 221–227. *Fig. 1–4.* 1924.—The ordinary ripening process of bananas [*Musa* spp.] is characterized by sugar formation at the expense of stored starch, the disappearance of astringency, and the development of the characteristic banana flavor. These changes do not occur in bananas that have been frozen. Investigation of ripe bananas showed the presence of tannin in chains of secretory cells accompanying the fibro-vascular bundles. Comparison with the unripe fruit of *Musa Cavendishii* Paxt. showed that the tannin of unripe and frozen fruit is in soluble form, while that of normally ripened fruit is insoluble. The contents of the secretory cells accompanying the fibro-vascular bundles of the peels of unripe bananas showed spheroids of caoutchouc which were wholly lacking in the corresponding cells of the pulp, which were highly tanniniferous. Microchemical investigation showed that acetaldehyde is absent in green bananas, is present only in traces in bananas which have been frozen before ripening, and develops in some quantity in the normal ripening processes. The coagulation of soluble tannin during ripening is attributed to the development of acetaldehyde. —*E. E. Stanford.*

9402. Griebel, C. **Über eine auffälige Form der Pektinverflüssigung by der Nachreife verschiedener Rosaceenfrüchte.** [A striking form of pectin hydrolysis in various after-ripened fruit of the Rosaceae.] Zeitschr. Untersuch. Nahrungs.- u. Genussmittel 49: 90–94. *Fig. 1.* 1925.—Fruit pectin is derived from the middle lamella. The ripe fruit of *Pyrus domestica* remains hard and astringent. When ripened off the tree it becomes soft, but still remains astringent and inedible. The substance of the middle lamella undergoes hydrolysis and globoids of mucilaginous pectin are formed. Similar globoids are found in fruit of *Prunus spinosa, Mespilus germanica, Pyrus latifolia, P. communis, P. torminalis, P. baccata,* and other species of *Pyrus.* All these fruit are also rich in tannin. This pectin hydrolysis takes place only by the action of living cells.—*E. E. Stanford.*

9403. Griebel, C. **Über die bei der Nachreife oder beim Teigigwerden bestimmter Fruchte eintretenden Veränderungen des Gerbstoffes (Inklusenbildung). [Alteration of tannin in certain fruit after ripened or over-ripe (formation of "Inklusen").]** Zeitschr. Untersuch. Narhungs- u. Genussmittel 49: 94–105. *Fig. 1.* 1925.—Numerous edible fruit when unripe or when ripening on the tree are characterized by astringency due to tannin localized in certain cells (tannin-idioblasts). When these fruit are ripened off the tree or become over-ripe the astringency disappears; the plasma of the tanniniferous cells dies, due to the development of acetaldehyde, and the soluble tannin becomes changed into an insoluble form which is therefore not perceived by the sense of taste.—*E. E. Stanford.*

9404. Griebel, C. **Zum Vorkommen von Acetaldehyd in Früchten und anderer Pflanzenteilen. [Occurrence of acetaldehyde in fruit and other plant parts.]** Zeitschr. Untersuch. Nahrungs- u. Genussmittel 49: 105–110. *Fig. 1.* 1925.—A continuation of work previously reported, and including an extensive list of plants whose fruit give a positive test for acetaldehyd, and also a list of plants whose fruit do not. Leaves, twigs, and other plant parts of various species were also tested, and the results reported. The paper includes a review of similar work by other authors.—*E. E. Stanford.*

9405. Hornemann, Curt. **Über Vitamingehalt der Sojabohne. [Vitamin-content of soy-beans.]** Zeitschr. Untersuch. Nahrungs.- u. Genussmittel 49: 115–120. 1925.—Soy beans [*Soja max*] contain vitamin A, especially in the oil. The cake after the extraction of the oil contains vitamin B. Feeding experiments on rats indicate the protein of this cake to be of high food value.—*E. E. Stanford.*

9406. Iwanoff, N. N. **Über die Ausscheidung des Harnstoffs bei Pilzen. [Excretion of urea by fungi.]** Biochem. Zeitschr. 157: 229–242. 1925.—*Aspergillus niger, Penicillium glaucum, Rhizopus nigricans,* and *Tieghemella orchidis* grown in pure culture on a substrate rich in N, produced and excreted urea.—*H. D. Hooker.*

9407. Munro, E. G. **Efficiency in sugar recovery.** Australian Sugar Jour. 17: 57–58. 1925.—Although a steady advance is being made in increasing the yield of cane per acre and the sugar content of the cane, the actual recovery of sugar from the cane seldom exceeds 80%. The sugar crystal takes on the shape peculiar to the composition of its mother liquor, and this formation is affected by various conditions existing in partial vacuum or under semi-atmospheric influences. Sucrose is assumed to be present in relatively concentrated solutions in the form of minute invisible crystals that are attracted to or adhere to a nucleus during the process of further concentration. The question as to what the nucleus is and whether crystallization into the visible stage under present-day methods of manufacture is due simply to abnormal conditions, opens a wide field for exploration. Suggestions for the improvement of manufacturing methods are made which may result in a recovery of about 95%.—*Nellie E. Fealy.*

9408. Ogilvie, P. J. **Discovery of the presence of vitamins in cane molasses.** Internat. Sugar Jour. 27: 139–140. 1925.—Hitherto most chemists and physiologists have held that sugar products owe their food value to their calorific content only, but recent work at the Iowa State College seems to show that cane molasses is rich in vitamin B—much richer in fact than beet or sorghum syrup. It gave better results in the production and rearing of young animals and in the number of litters and of young to the litter, and very much better results in the rearing of these litters than did yeast, which had hitherto been held to be a good source of vitamin B.—*Nellie E. Fealy.*

9409. Paine, H. S., M. S. Badollet, and J. C. Keane. **Colloids in cane and beet sugar manufacture.** Internat. Sugar Jour. 27: 147-152. 1925.—The clarification of cane and beet juices as ordinarily practiced involves primarily the elimination of colloids by such typically colloidal mechanisms as adsorption and flocculation. As colloids at various stages of transition between the most typical hydrophobe and hydrophile conditions are doubtless encountered in both cane and beet products the applicability of various investigational methods must be decided rather specifically in each case. The value of the quantitative data is dependent upon adequate information regarding the qualitative behavior of the predominant colloids and therefore the investigation of cane and beet colloids should be pursued from both standpoints simultaneously. The authors describe their procedure in a somewhat systematic investigation of the subject in question, and give some of the initial results, under 3 headings: (1) Investigational methods and criteria, (2) surface tension, gold number, and ultrafiltration data; and (3) reversible and irreversible colloids.—*Nellie E. Fealy.*

9410. Paine, H. S., M. S. Badollet, and J. C. Keane. **Colloids in cane and beet sugar manufacture.** Internat. Sugar Jour. **27**: 210-214. 1925.—Tabulated results, with analysis of each table, show araban and galactan contents of total colloids from beet products, composition of colloids separated from Steffen beet molasses, and araban content of total colloids from beet products. Ultramicroscopic cataphoresis measurements are reported. The relation between colloid concentration and surface tension, and the volume of the sugar before boiling, volume at first boiling point, and volume at boiling point 117.8°C. in foaming experiments are described. The conclusion drawn from the investigation is that the moot question of influence of cane and beet pigments upon the production of off-color granulated sugar resulting from various factory processes may be accurately investigated by separating the pigments and other colloids from typical samples of the sugar produced, and then reasoning *a posteriori* to the initial stages of the factory procedure instead of depending solely upon *a priori* reasoning based upon the pigments in cane and beet juices.—*Nellie E. Fealy.*

9411. Pfeiffer, H. **Ueber die Wasserstoffionenkonzentration [H˙] als Determinationsfaktor physiologischer Gewebegeschehen in der sekundären Rinde der Pflanzen. [H-ion concentration as a determiner of physiological phenomena in the secondary cortex of plants.]** New Phytol. **24**: 65-98. *5 fig.* 1925.—A study of crystallization of calcium oxalate in the presence of media of different H-ion concentration shows that the process of crystallization is determined at least partly by hydrion concentration. The monocline crystals are formed at low pH values, while the tetragonal and "gland" forms occur at neutral or basic pH values. In the secondary cortex of various European trees, in general at acid reactions (to pH 5.0) monocline crystals are formed, from pH 5.0-6.5 tetragonal crystals, and at strongly alkaline pH values, besides, tetragonal, glandular and spheritic crystals occur. Neutral red fixes the degree of acidity decisive for the formation of tetragonal crystals. In the secondary cortex the actual acidity, while continually changing, shows a maximum on the acid side of pH 2.4-3.8 and on the basic side of pH 7.2-8.6 (?). The zonal distribution of crystals of calcium oxalate is reducible to the phenomenon of Liesegang's rings. The plant cortex is discussed as in dynamic equilibrium between internal and external factors. The sclerization of the cell walls occurs at a well defined H-ion concentration of the proteins of the wall; the cells of a thin-walled cortex show a somewhat acid reaction, while sclerized elements are more or less alkaline. The iso-electric point may determine the maximum precipitation of cytoplasmic colloids.—*I. F. Lewis.*

9412. Poore, Homer D. **Citrus pectin.** U. S. Dept. Agric. Dept. Bull. 1323. *1-16.* 1925.—The properties of citrus pectin and methods for its production were studied. An extended bibliography is included. The dialysis of pectin extracts in an osmogene containing collodion-impregnated cloth membranes removed most of the bitter principles, but the dialysis was too slow and about $\frac{1}{3}$ of the pectin dialyzed. The best method of extraction was to heat the finely ground peel or residue with acidified water and clarify the expressed extract with kieselguhr. The bitter principle was removed with alcohol from powdered pectin prepared from concentrated solutions of pectin in the laboratory and in a commercial plant. A process whereby the pectin extracts are concentrated to a paste and washed by a continuous system with a minimum quantity of denatured alcohol was devised. Little hope is indicated of distinguishing chemically between lemon, orange, and apple pectins; the composition, when calculated to the alcohol-precipitate basis, is much the same for each product. A standard jelly test for determining the quality of the pectins produced throughout the investigation was developed. The proportions of citric acid, sugar, and citrus pectin required to give good jellies were determined. The lower limit in the finished jelly for citric acid was 0.045% for pectin 0.20% and for sucrose 37%.—*Author.*

9413. Schmitz, Henry. **Studies in wood decay V. Physiological specialization in Fomes pinicola Fr.** Amer. Jour. Bot. 12: 163–177. *3 pl.* 1925.—Four strains of Fomes pinicola, derived from Douglas fir, white fir, hemlock and western white pine, were grown in culture. They were similar in their effect on the shifting of the H-ion concentration of the substrate when grown on carrots. The enzyme activity both of the carrot extracts and of the ground-up mycelium was in many cases found to be markedly different. Wherever agar plates were inoculated with 2 of these different strains the colonies did not intermingle, but a clear line of demarcation remained between them; whereas colonies from inoculations of the same strain grew into each other without showing any inhibiting effect. The effect of various nitrogenous substances, and of growth on liquid media, were different for the different strains. In laboratory experiments on wood decay the 4 strains also differed considerably in their effect. The evidence indicates that there is considerable physiological variation within this species. —*E. W. Sinnott.*

9414. Sherman, H. C., and L. C. Boynton. **Quantitative experiments upon the occurrence and distribution of vitamin A in the body, and the influence of the food.** Jour. Amer. Chem. Soc. 47: 1646–1653. 1925.

9415. Sherman, H. C., and H. E. Munsell. **The quantitative determination of vitamin A.** Jour. Amer. Chem. Soc. 47: 1639–1646. 1925.

9416. Sherman, H. C., and L. B. Storms. **The bodily store of vitamin A as influenced by age and other conditions.** Jour. Amer. Chem. Soc. 47: 1653–1657. 1925.

9417. Sierakowski, S. **Über Veränderungen der H-Ionenkonzentration in den Bakterienkulturen und ihr Entstehungsmechanismus. [Changes in hydrogen ion concentration in bacterial cultures and the mechanism of their origin.]** Biochem. Zeitschr. 151: 15–26. *2 fig.* 1924.—The pH value of sugar-free bacterial cultures approached 7 when the original solution was either acid or basic. The rate of change was a function of the rate of growth. All cultures finally became alkaline. Increase in acidity occurred only when CO_2 could escape or was absorbed. Increase in alkalinity is attributed to the formation of unknown alkaline metabolic products.—*H. D. Hooker.*

9418. Suzuki, U., S. Odake, and T. Mori. **Über einen neuen schwefelhaltigen Bestandteil der Hefe. [A new sulphur containing constituent of yeast.]** Biochem. Zeitschr. 154: 278–289. *4 fig.* 1924.—A base of empirical formula $C_{11}H_{15}N_5SO_3$ was isolated from yeast. It is soluble in warm water, acids and alkalies, insoluble in alcohol and ether, melts at 208°C., and forms a crystalline picrate melting at 183°C. On hydrolysis with 3% HCl, it yields adenine and a S sugar, $C_6H_{12}O_4S_3$, which gives a phenylosazone melting at 158-9°. On the basis of various reactions, the compound is thought to be adenyl thiomethyl pentose.—*H. D. Hooker.*

9419. Tausson, W. O. **Zur Frage über die Assimilation des Paraffins durch mikroorganismen. [The assimilation of paraffin by microörganisms.]** Biochem. Zeitschr. 155: 356–368. 1925.—A fungus related to *Aspergillus flavus* used 75% of the paraffin in the culture. Starch, maltose, glucose and mannit were used, glycerol and peptone to a less degree and sucrose still less as a source of C. Nitrates and NH_3 were used equally as a source of N. Growth was best at pH 7–8. Nitrates in the culture led to a decrease of acidity. The economic coefficient of paraffin was over 28.2% which is associated with its preference over glucose and maltose. Fatty acids were probably not formed as intermediate products in paraffin utilization, as the solution became alkaline. Esters of higher alcohols and fatty acids are assumed to be the intermediate products. Other molds and bacteria were able to use paraffin. —*H. D. Hooker.*

9420. Tupper-Carey, R. M., and J. H. Priestley. **The composition of the cell-wall at the apical meristem of stem and root.** Proc. Roy. Soc. London B 95: 109–131. 1923.—

Chemical studies suggested by differences in permeability of apical meristems of root and shoot of broad bean, show differences in micro-reactions of cellulose which are apparently explained by assuming that walls begin as a protoplasmic interface, complex in its chemical nature, and develop by a process of chemical simplification. These steps occur most rapidly in the green stem tip, less so in the etiolated stem tip, and least so in the radicle. In the meristem of the normal green stem, cellulose tests are obtained without difficulty. In the etiolated shoot tip they are facilitated by treatment which removes fatty acid. In the meristem of plumule and radicle, not only fatty acid but protein components must be removed from intimate association with the cellulose before satisfactory tests can all be exhibited. Calcium content is highest in the green stem and lowest in the radicle meristem. Fatty acids present at first may disappear through the formation of calcium soaps, with a resultant increase in permeability of the wall. Pectin is found in walls of all types of meristem. The middle lamellae all show protein and pectin, the former at length disappearing and the latter forming calcium salts. In adult stem parenchyma the middle lamella also develops fatty acid which is normally changed to calcium soap in the green stem.—*P. B. Sears.*

9421. Vergár, V., and H. Zih. **Weitere Untersuchungen über die Stoffwechselregulierung bei B. coli comm. III. [Metabolic regulation of B. coli. comm. III.]** Biochem. Zeitschr. **151:** 254–258. *7 fig.* 1924.—Acid production by *B. coli communis* was inhibited by ethyl and methyl alcohol and formaldehyde, which retarded bacterial growth. In the absence of these toxic substances, acid formation continued until the pH value was 4.65.—*H. D. Hooker.*

9422. Warkany, J. **Über das Verhalten der Reservekohlehydrate bei der assimilatorischen und dissimilatorischen Tätigkeit der Hefe. [The role of reserve carbohydrates in yeast metabolism.]** Biochem. Zeitschr. **150:** 271–280. 1924.—In aerated glucose solution, the glycogen content of yeast increased between 84 and 288%, the gum content 28.7 to 56%. A 3rd reserve carbohydrate appeared similar to glycogen, but yielded a compound which reduced Fehling's solution in the cold after hydrolysis with 2.7% HCl. In the absence of glucose, this disappeared and the other carbohydrate reserves decreased.—*H. D. Hooker.*

METABOLISM (NITROGEN RELATIONS)

9423. Blanchetiere, A. **L'evolution de nos connaissances sur la structure chimique des matières protéiques. [The development of our knowledge of the chemical structure of proteins.]** Bull. Soc. Chim. Biol. **7:** 218–330. 1925.—A résumé of the literature, accompanied by a bibliography of 388 titles.—*Joseph S. Caldwell.*

9424. Colin, Henri, et R. Franquet. **Discontinuité chimique chez les plantes gréffees. La greffe Chenopodium vulvaria-Chenopodium album. [Chemical discontinuity in grafted plants.]** Bull. Mus. Hist. Nat. [Paris] **29:** 630. 1923.—*Chenopodium Vulvaria* is characterized by the presence of trimethylamine, of which there is no trace in *C. album.* Using *C. album* as the stock, scions of *C. Vulvaria* were grafted upon it. Testing the stock with KI which forms crystals when trimethylamine is present, gave negative results; showing the chemical discontinuity of the graft.—*John M. Fogg, Jr.*

9425. Fagan, T. W. **The variation in the moisture and nitrogen content of the potato during growth and storage.** Welsh Jour. Agric. **1:** 110–115. 1925.—The potatoes in both 1922 and 1923 were planted in April and havested in October. The first sample was taken in June, the tubers at the time being the size of marbles. Subsequent to this, monthly samples were taken until the crop was harvested. The principal changes during growth were a gradual decrease in the moisture content with a corresponding increase in the dry matter of the potatoes. In a similar manner, the percentage of total N, with the exception of the June sample, showed a steady increase. The percentage of total N in the sample taken in June was comparatively high, though at this date the ratio of protein N to total N was lower than at any other time. As the season advanced, however, this ratio gradually increased until at the time of harvesting it formed from 55 to 58% of the total. The potatoes were stored under ordinary farming conditions. During storage there appeared to be but very slight variation. There was a small increase in the percentage of dry matter and total N, but the ratio of protein to total N during this period remained fairly constant.—*Author.*

9426. Harris, L. J. **The titration of amino- and carboxyl-groups in amino acids, polypep-**

tides, etc. Parts I–III. Investigations with aqueous solutions. Proc. Roy. Soc. London B 95: 440–484. *Fig. 1–14.* 1923.

9427. Harris, L. J. **The titration of amino- and carboxyl-groups in amino acids, polypeptides, etc. Parts IV–VI. Estimations in presence of formol and alcohol.** Proc. Roy. Soc. London B 95: 500–522. 1924.

9428. Iwanoff, N. N. **Absorption des Harnstoffs durch Pilze. [Urea absorption by fungi.]** Biochem. Zeitschr. 150: 115–122. 1924.—Mushrooms absorbed urea until the fruiting bodies contained 14.9% of the dry weight. Storage occurred particularly in the hymenium. Thiourea was absorbed in the absence of urea. *Bolbitius vitellinus* stored no urea but accumulated thiourea, the latter not being decomposed by urease.—*H. D. Hooker.*

9429. Iwanoff, N. N. **Der Pilzharnstoff als Ersatzmittel des Asparagins. [Fungous urea as a substitute for asparagine.]** Biochem. Zeitschr. 154: 376–390. 1924.—When fruiting bodies of *Lycoperdon piriforme, L. molle, Psalliota pratense* and *Tricholoma sordidum* were dipped in glucose solution, glucose was absorbed and retarded autolytic processes leading to urea formation, in some cases causing it to disappear. Urea utilization led to an increase of N precipitated by lead acetate and of water-insoluble, complex N compounds. In the absence of carbohydrates, urea accumulated; in their presence it was used in the same manner as asparagin and glutamine.—*H. D. Hooker.*

9430. Iwanoff, N. N. **Über die Ursache des verschiedenen Harnstoffgehalts in Pilzen. [The cause of the variable urea content of fungi.]** Biochem. Zeitschr. 154: 391–398. 1924.—Analyses of *Lycoperdon piriforme, Bovista nigrescens, Psalliota pratensis, P. campestris, Tricholoma sordidum, Pholiota spectabilis* and *P. mutabilis* showed that urea accumulation depended either on an excess of N or a lack of carbohydrate. *L. piriforme* contained 4.3% urea when the total N was 7.9% and no urea when the total N was 4.2%. In pure culture the mushrooms grown on gelatin and malt extract accumulated urea, those grown on agar and malt extract had no trace of urea.—*H. D. Hooker.*

9431. Jodidi, S. L. **Physiological studies on cereals. III. The occurrence of polypeptides and amino acids in the ungerminated maize kernel.** Jour. Agric. Res. 30: 587–592. 1925.—Three corn varieties were investigated, namely: (1) Four County Corn, an Iowa dent variety; (2) United States Selection No. 77, a white dent variety; and (3) United States Selection No. 193, an 8-rowed yellow flint. The total, protein and non-protein N was in (1), respectively, 1.70, 1.63 and 0.073; in (2) 1.59, 1.52 and 0.068 and in (3) 1.46, 1.39 and 0.064%, based on the oven-dried corn. The non-protein N of the ungerminated kernel was made up chiefly of acid amides, amino acids and polypeptides. The acid amides were estimated by hydrolyzing the concentrated, purified corn extracts with HCl (to 20% concentration) for 30 minutes and subsequent distillation MgO. The NH_3 thus obtained represented the N of acid amides. For the determination of the amino acids the concentrated corn extracts were freed from CO_2, phosphoric acid and coloring matter in a definite way and then titrated by Sörensen's formol-titration method. The estimation of the polypeptides was effected by hydrolyzing concentrated purified extracts with HCl (to 20% concentration of the acid) for 12 hours, subsequent removal of the NH_3, and titrating the extracted residue by the formol-titration method. The results secured here diminished by the amino N obtained prior to hydrolysis represented the N of the polypeptides. The outstanding feature of the investigation is the fact that the ungerminated kernel of the 3 corn varieties in question contains polypeptides and free amino acids. Numbers (1), (2) and (3) were found to contain, respectively, 2.65, 2.52 and 3.49% of amino N calculated on the total N; 1.88, 1.19 and 1.44% of acid amide N; and 4.06, 3.14 and 2.47% of peptide N.—*Author.*

9432. Linderstrøm-Lang, K. **On the ionisation of proteins.** Compt. Rend. Trav. Lab. Carlsberg [Copenhagen] 15^7: 1–30. 1924.—This is an attempt to develop an expression based on the law of mass action for the adsorption of H-ion by a protein. An ion adsorption expression is first formulated, then its agreement shown with that arrived at by application of the law of mass action. The formulation is then compared with the results of an experiment on the adsorption of H-ion by egg albumin. The danger of applying ordinary adsorption theories to the problems of proteins is pointed out.—*F. Weiss.*

9433. Lüers, H., and G. Nowak. **Das Hefe-Zymocasein.** [**Zymocasein of yeast.**] Biochem. Zeitschr. **154**: 310–320. 1924.—Yeast plasmolysed with salt was autolysed and the zymocasein dissolved in soda. After filtering, the casein was precipitated at the isoelectric point, pH 4.5. The precipitate was dried and the amino acid content determined and compared with that of other protein. Glycine was present, isoleucine and valine were absent. Glutamic acid and NH_3 were unusually high.—*H. D. Hooker.*

9434. Markley, Klare S., and Raymond M. Hann. **A comparative study of Gunning Arnold and Winkler boric acid modifications of the Kjeldahl method for the determination of nitrogen.** Assoc. Official Agric. Chem. **8**: 455–467. *Fig. 1–4.* 1925.—The boric acid method, which utilizes a 4% solution of boric acid as an absorption medium for the liberated NH_3, following its conversion to $(NH_4)_2SO_4$ by digestion with H_2SO_4 containing 10% P_2O_5, and subsequent release with an excess of alkali, is equally as accurate as the official Kjeldahl-Gunning-Arnold method of the Association of Official Agricultural Chemists.—Comparative results on soils, solutions, alkaloids, and other organic compounds are given. The indicators used and the advantages of the boric acid method in regard to economy of time, materials, and standard solutions are discussed.—*Klare S. Markley.*

9435. Panganiban, Elias H. **Temperature as a factor in nitrogen changes in the soil.** Jour. Amer. Soc. Agron. **17**: 1–31. 1925.—A study of the effect of constant and alternating temperatures in connection with ammonification, nitrification, denitrification and N fixation under both aerobic and anaerobic conditions.—*F. M. Schertz.*

9436. Peck, C. L. **Fixation of atmospheric nitrogen by activated sludge.** Engineering News-Rec. **90**: 487–489. 1923.—Under certain conditions it is possible to fix atmospheric N by aeration in the presence of activated sludge.—The amount of atmospheric N so fixed has in some cases been equal to 65% of the amount of nitrogen in the sewage. The condition essential to fixation of atmospheric N seems to be an environment favorable to the growth of *Bacillus Crenothrix.* Where fixation was successful it was possible to recover 848 pounds per day of dry humus per 10,000 people contributing to the sewage. The humus had an average NH_3 content of 7.92%. The presence in the sewage of 2 parts per million of ferric oxide seems to be essential. A detention period in aeration in excess of 6 hours is probably necessary. The quantity of air used is not a controlling factor so long as a healthy aerobic sludge is maintained.—*From Author's summary.*

9437. Prát, S. **Die Farbstoffe der Potamogetonblätter.** [**The pigments of Potamogeton leaves.**] Biochem. Zeitschr. **152**: 495–497. 1924.—Xanthophyll and rhodoxanthin were extracted from the brown leaves of *Potamogeton natans* and *P. crispus.* Chlorophyll a and b were present, yielding phytochlorin and phytorhodin.—*H. D. Hooker.*

9438. Prjanischnikow, D. **Asparagin und Harnstoff.** [**Asparagin and urea.**] Biochem. Zeitschr. **150**: 407–423. *1 fig.* 1924.—Pea roots grew longer in ammonium bicarbonate than with the chloride or phosphate. Saturation with CO_2 increased the growth of both stems and roots, and growth was as great as when $Ca(NO_3)_2$ was used. Asparagin increased more rapidly in *Vicia sativa* and *Zea Mays* seedlings when grown in ammonium bicarbonate plus $CaCo_3$ than in $Ca(NO_3)_2$. Asparagin formation in plants is compared to urea formation in animals.—*H. D. Hooker.*

9439. Rippel, A., and O. Ludwig. **Untersuchungen über physiologische Gleichgewichtszustände bei Pflanzen. Über die Abhängigkeit der Wachstumskonstanten von Mais (Zea Mays L.) von der Höhe der Stickstoffernährung.** [**Physiological equilibria in plants. The dependence of growth constants in Zea Mays on the degree of nitrogen nutrition.**] Biochem. Zeitschr. **155**: 133–147. *1 fig.* 1925.—The growth of *Zea Mays* was fitted to Robertson's formula and the constant, K, calculated for plants supplied with different amounts of N; K increased with the N supply. Mitscherlich's yield constants are shown to be variable.—*H. D. Hooker.*

9440. Supniewski, J. **Untersuchungen über den Stoffwechsel der Stickstoffverbindungen in den Kulturen von Bacillus pyocyaneus.** [**The nitrogen metabolism of Bacillus pyocyaneus.**] Biochem. Zeitschr. **154**: 98–103. 1924.—*Bacillus pyocyaneus* used NH_3 as a source of N and converted amino and amido-compounds, NO_3 and NO_2 to NH_3.—*H. D. Hooker.*

METABOLISM (ENZYMES, FERMENTATION)

9441. Adowa, A. N. **Zur Frage nach den Fermenten von Utricularia vulgaris. I. [Enzymes of Utricularia vulgaris.]** Biochem. Zeitschr. **150:** 101–107. 1924.—Saline and HCl extracts of *Utricularia vulgaris* tissues contained α- and β-proteases as shown by the digestion of egg white, gelatin, casein and fibrin. Digestion with HCl increased β-protease activity. $CaCl_2$ in neutral solution increased α-protease activity.—*H. D. Hooker.*

9442. Adowa, A. N. **Zur Frage nach den Fermenten von Utricularia vulgaris. II. Der relative Gehalt der Bläschen und Zweige von Utricularia vulgaris an proteoklastichen Fermenten. [The enzymes of Utricularia vulgaris. The relative protease content of bladders and branches.]** Biochem. Zeitschr. **153:** 506–509. 1924.—Bladders of *Utricularia vulgaris* contained more α-protease than the branches. Green bladders digested more gelatin in neutral solution than red or blue bladders, but not in alkaline solution. The protease activity of extracts of branches was very weak. The β-protease activity of both bladders and branches was weaker than the α-protease activity.—*H. D. Hooker.*

9443. Barendrecht, H. P. **Saccharase und die zweite Wirkungsart der Wasserstofionen. [Sucrase and the second effect of hydrogen ions.]** Biochem. Zeitschr. **151:** 363–370. 1924.—Sucrase activity was found to be influenced by H ions in the same 2 ways as urease activity. The enzyme is thought to be effective by a radiation absorbed only by the substrate and by H ions. This is formulated mathematically.—*H. D. Hooker.*

9444. Bernhauer, K. **Zum Problem der Säurebildung durch Aspergillus niger. [Acid formation by Aspergillus niger.]** Biochem. Zeitschr. **153:** 517–521. 1924.—Gluconic acid formation by *Aspergillus niger* was demonstrated, and the acid identified. The optimum temperature was 30°C. Gluconic acid is not considered an intermediate product in citric acid formation. The 2 acids were produced by different strains of *Aspergillus niger.*—*H. D. Hooker.*

9445. Biedermann, W., und C. Jernakoff. **Die Salzhydrolyse der Stärke. III. Hydrolyse durch anorganische Katalysatoren. [The hydrolysis of starch by inorganic catalysts.]** Biochem. Zeitschr. **149:** 309–328. 1924.—It is concluded, after discussing the literature, that starch is hydrolysed by inorganic catalysts only in the presence of free or combined O_2.—*H. D. Hooker.*

9446. Biedermann, W., und C. Jernakoff. **Die Salzhydrolyse der Stärke. IV. Hydrolyse durch Blutfarbstoff und pflanzliche Peroxidasen. [Salt hydrolysis of starch with blood pigment and plant peroxidases.]** Biochem. Zeitschr. **150:** 477–491. 1924.—Starch was hydrolyzed by very dilute hemoglobin, and by potato and horseradish oxidase. The presence of molecular O_2 was essential.—*H. D. Hooker.*

9447. Bleyer, L. **Über die Änderung der Pufferung und die Aminostickstoffzunahme in einigen Nahrsubstraten durch bakterielle Einwirkung. [The change in the buffer content and the increase in amino nitrogen in some nutrient substrates as the result of bacterial action.]** Biochem. Zeitschr. **157:** 220–228. *10 fig.* 1925.—The relation between buffer and amino N content was followed during the decomposition of nutrient substrates, such as sheep serum, gelatin, casein and Witte's peptone, by various bacteria and bacterial enzymes. Proteolysis of denatured proteins occurred at 6.5–8.0. The medium became alkaline when the living bacteria were present, but slight acidity developed in the enzyme experiments.—*H. D. Hooker.*

9448. Boas, F., und F. Merkenschlager. **Pflanzliche Tyrosinasen (mit besonderer Berücksichtigung der Chininwerkung). [Plant tyrosinases with special reference to the action of quinine.]** Biochem. Zeitschr. **155:** 197–227. *8 fig.* 1925.—Numerous plant tissues turned black in 0.1% quinine sulphate, as a result of disorganization of cell structure and liberation of tyrosinase. Phosphorus compounds retarded the blackening by maintaining cell structure. The liberation of tyrosinase occurred whenever the cells died or were killed without destroying the enzyme. Earth-alkali salts did not lead to melanin formation; alkali salts did, the anion being more active. Hydroquinone and pyrocatechin induced spontaneous pigmentation; resorcin did not. Tyrosin, the precursor of melanin, acted immediately.—*H. D. Hooker.*

9449. Brahm, C. **Über die bei der Sauerfutterbereitung entstehenden flüchtigen Fett-**

saüren. I. Elektrosilage von Mais. [Volatile fatty acids arising during ensilage of maize.] Biochem, Zeitschr. **156**: 15–20. 1925.—Acetic, propionic, butyric, valerianic, methylethylacetic, and capronic acids were found in maize silage. Formic acid was absent.—*H. D. Hooker.*

9450. Butkewitsch, W. **Über die Bildung der Glucon- und Citronensäure in den Pilzkulturen auf Zucker. [Gluconic and citric acid formation in sugar cultures of fungi.]** Biochem. Zeischr. **154**: 177–190. 1924.—Gluconic as well as citric and oxalic acids accumulated in sugar cultures of *Aspergillus niger.* Calcium gluconate was precipitated from the cultures with alcohol. Citric acid was not formed from gluconic acid. Citric acid was produced predominantly in more acid cultures, gluconic acid in less acid media.—*H. D. Hooker.*

9451. Chrzaszcz, T. **Die dextrinierende Kraft der Malzamylase verschiendener Getreidearten und einige Beobachtungen über die Reaktivierung der durch hohe Temperatur inaktivierten Amylase. [The dextrinizing strength of malt amylase of various grains and the reactivation of amylase inactivated by heat.]** Biochem. Zeitschr. **150**: 60–92. 1924.—The optimum H-ion concentration for amylases from malted barley, rye, wheat, oats and millet was pH 4.70–5.28. Dextrinization depended also on the concentration of amylase and starch and on the temperature. Amylase inactivated at 90°–100°C. was reactivated by shaking with air, O_2 or H_2O_2.—*H. D. Hooker.*

9452. Church, Margaret B. **Soy and related fermentations.** U. S. Dept. Agric. Dept. Bull. 1152. *1–27. Pl. 1–2, fig. 1–5.* 1923.—This investigation of soy sauce and its products, as miso, was undertaken for the information of manufacturers. Attention was drawn to this mold fermentation process by studies of the group *Aspergillus flavus-oryzae* used in the Orient for its proteolytic enzymes. The experimental work included indicates the stage which the soy sauce industry has reached and suggests the problems with which the prospective manufacturer in a new country must contend. Experimental work reported explains many steps often followed in an empirical manner. Varying the proportions of prepared beans and wheat used showed why roasted and dried ground wheat is valuable in controlling the process. The best methods are indicated for soaking and cooking the beans in order to prevent the growth of slime-producing sporeforming bacteria of the *B. vulgatus* and *B. subtilis* groups, which are detrimental to mold growth. A similar sauce having an acceptable flavor was prepared from peanut press cake. The greater difficulties encountered in using a comminuted product like press cake as compared with whole seed are commented upon. This study of soy sauce is based on the methods used in commercial factories of Japan where a more or less uniform product is obtained. Photographs illustrate the process of manufacture in Japan.—*Author.*

9453. Gottschalk, A., und C. Neuberg. **Untersuchungen über die Phosphorylierung. [Phosphoration.]** Biochem. Zeitschr. 154: 492–494. 1924.—The ability of bottom yeast after certain treatments to form large amounts of hexose-phosphate is considered to be an abnormal, artificially induced process.—*H. D. Hooker.*

9454. Graaff, W. C. de, und A. J. LeFevre. **Beiträge zur Kenntnis der bakteriellen Gärungen, insbesondere in der Koli-Typhusgruppe. [Bacterial fermentation, especially in the coli-typhus group.]** Biochem. Zeitschr. 155: 313–332. 1925.—The sugars and sugar alcohols fermented by *Bacterium coli, Bacillus paratyphi A & B, B. typhi* and *B. dysenteriae* were determined. Erythrit, arabit, adonit, idose and gulose were not fermented. Glycol, glycerol, glyceric aldehyde, glyceric acid and dihydroxyacetone were fermented by *Bact. coli* and *B. paratyphi* B to acetaldehyde, acetic acid, CO_2, H, and in some cases succinic acid and traces of lactic acid and ethyl alcohol. Pyruvic acid was fermented to acetic acid, CO_2, and H.—*H. D. Hooker.*

9455. Hägglund, E., und A. M. Augustson. **Über die Abhängigkeit der alkoholischen Gärung von der Wasserstoffionenkonzentration. I. [The dependence of alcoholic fermentation on hydrogen ion concentration.]** Biochem. Zeitschr. 155: 334–347. *5 fig.* 1925.—The optimum pH varied with the acid and sugar content of the substrate. Aside from this, the greatest activity of fermenting yeast occurred at pH 4.5.—*H. D. Hooker.*

9456. Hatano, J. **Über "Taka-lab."** Biochem. Zeitschr. **149**: 228–231. 1924.—"Taka-lab" coagulated fresh milk and casein solutions containing Ca. Japanese material was more active than an English preparation.—*H. D. Hooker.*

9457. Hatano, J. **Über die Spaltung von Seidenfibroinpepton durch Takadiastase. [The cleavage of silk fibroin peptone by Taka-diastase.]** Biochem. Zeitschr. **151**: 335–336. 1924.—Silk fibroin peptone yielded 12% tyrosine on acid hydrolysis. With Taka-diastase the yield was 10.86%.—*H. D. Hooker.*

9458. Hatano, J. **Über Amygdalinspaltung durch Takadiastase. [The cleavage of amygdalin by Taka-diastase.]** Biochem. Zeitschr. **151**: 498–500. *1 fig.* 1924.—Japanese Taka-diastase hydrolysed amygdalin to 2 molecules of glucose, benzaldehyde and HCN. Beside α-glucosidase, Taka-diastase contains gentio-biase and β-phenol glucosidase.—*H. D. Hooker.*

9459. Hatano, J. **Über die Spaltung verschiedener β-Glucoside durch Takadiastase. [The cleavage of various β-glucosides by Taka-diastase.]** Biochem. Zeitschr. **151**: 501–503. 1924.—The presence of β-glucosidase in Taka-diastase was shown by the hydrolysis of β-methyl glucoside, salicin and aesculin.—*H. D. Hooker.*

9460. Hattori, Y. **Das Verhalten von α- and β-Methylglucosid zur Takainvertase. [The relation of methylglucosides to Taka-invertase.]** Biochem. Zeitschr. **150**: 150–158. *5 fig.* 1924.—Yeast invertase is inactivated by α-glucosides but not by β-glucosides. The situation is reversed for Taka-invertase. Inactivitation is not independent of the concentration of enzyme and substrate.—*H. D. Hooker.*

9461. Hodel, P., und N. Neuenschwander. **Gärung und Eisensalze. [Fermentation and iron salts.]** Biochem. Zeitschr. **156**: 118–123. *4 fig.* 1925.—Yeast fermentation was retarded by ferric ions in proportion to their concentration. It was not affected by ferrous ions. The retarding action of $Fe(NO_3)_3$ was greater than that of iron alum, and this was greater than $FeCl_3$.—*H. D. Hooker.*

9462. Hoop, L. de., und H. A. van Laer. **Untersuchungen über diastatischen Stärkeabbau. [Hydrolysis of starch by diastase.]** Biochem. Zeitschr. **155**: 234–244. 1925.—Starch was not hydrolysed quantitatively to maltose by malt diastase. The residual dextrin could be filtered by ultra-filtration, was more resistant to acids than maltose, and was not affected by diastase.—*H. D. Hooker.*

9463. Hoppert, C. **Über ein neues biochemisches verfahren zur Spaltung razemischer Aminosäuren. [The separation of racemic mixtures of aminoacids.]** Biochem. Zeitschr. **149**: 510–512. 1924.—The action of Taka-diastase in hydrolysing only benzoyl-d-alanine was used in the preparation of d-alanine from a racemic mixture.—*H. D. Hooker.*

9464. Hosokawa, T. **Über Auxoureasen. [The auxo-ureases.]** Biochem. Zeitschr. **149**: 363–373. 1924.—The auxo-bodies were separated from soybean and Jack-bean urease by precipitation with cholesterol. The free enzyme was activated by adsorption on fibrin. Calcium and $SrCl_2$ increased urease activity but not as much as KCN; $BaCl_2$ was inactive. Sodium citrate, oxalate and fluoride had a powerful action; KCl and NaCl were much less active, Mg and, under certain conditions, Na were antagonistic to Sr.—*H. D. Hooker.*

9465. Iwanoff, N. N. **Über die Aktivität der Urease in hohen Alkoholkonzentrationen. [Urease activity at high alcohol concentrations.]** Biochem. Zeitschr. **150**: 108–114. 1924.—Soybean urease was active in 80–95.2% alcohol or 80–85% acetone.—*H. D. Hooker.*

9466. Jensen, P. Boysen. **Studien über die Kinetic der Zymasegärung. [The kinetics of zymase fermentation.]** Biochem. Zeitschr. **154**: 235–262. *14 fig.* 1924.—Measurement of the velocity of CO_2 evolution at constant temperature and H-ion concentration but with various concentrations of zymase, co-enzyme, phosphate, hexose-phosphate, acetaldehyde and glucose showed it to be approximately proportional to zymase concentration except when the concentration of 1 of the other essential components was so low as to be limiting.—*H. D. Hooker.*

9467. Karrer, P., und M. Staub. **Über Gentiobiase.** Biochem. Zeitschr. **152**: 207–210. 1924.—It is suggested that gentiobiase and cellobiase may be identical.—*H. D. Hooker.*

9468. Kochmann, R. **Über Auxoureasen. Der Mechanismus der Kalkwirkung. [The mechanism of the action of calcium on auxo-ureases.]** Biochem. Zeitschr. **151**: 259–267. 1924.—Calcium increased urease activity in proportion to its concentration, protected urease from spontaneous inactivation and reactivated inactivated urease; Ca had no effect in the presence of urea or when sodium acetate was used as buffer in place of PO_4. Large amounts of Mg increased urease activity but counteracted the action of Ca.—*H. D. Hooker.*

9469. Kopaczewski, W. **Sur la coagulation de la pectine. [The coagulation of pectin.]** Bull. Soc. Chim. Biol. 7: 419–428. 1925.—When pectin from carrots and pectase from alfalfa leaves, purified by prolonged dialysis, are mixed, coagulation of pectin no longer occurs. It occurs upon addition of salts of Ca, Ba, Sr, Mg, Fe or Cu to the mixture. All these salts also show power to coagulate pectin in the absence of pectase; and Cu and Fe salts, especially, greatly exceed pectase in coagulating power. Salts of the alkalies do not show antagonistic effects with Ca; a given amount of Ca salt coagulates pectin in equal time whether an alkali salt be present or absent. The optimum condition for action of pectase is a neutral medium; acids depress activity while alkalies themselves exert a coagulating effect. In the presence of electrolytes, the action of pectase on pectin is accompanied by the development of an acid reaction, and the pectin is no longer precipitable by alcohol. No such changes occur when both pectin and pectase, previously purified by thorough dialysis, are mixed. The author considers that any purely chemical explanation of coagulation of pectin is impossible.—*Joseph S. Caldwell.*

9470. Licht, H. **Untersuchungen über den Einfluss der Bakterien auf de Gallensäure. [The action of bacteria on choleic acid.]** Biochem. Zeitschr. 153: 159–164. 1924.—Bacteria were unable to break the glycin-cholic acid bond of choleic acid, but were able to change the cholic acid complex so that the choleic acid was no longer gravimetrically demonstrable. *Bacterium coli, Bacillus faecalis alcaligines, B. proteus, B. typhi, B. pyocyaneus, Streptococcus pyogenes longus, Staphylococcus aureus* and the natural intestinal flora were used.—*H. D. Hooker.*

9471. Liebermann, L. v. **Entstehung eines die Reaktionen des Formaldehyds gebenden Körpers bei der sauren Gärung des Krautes. [The appearance of a substance giving the reactions of formaldehyde during sauerkraut fermentation.]** Biochem. Zeitschr. 154: 176. 1924.

9472. M'Leod, J. W., and J. Gordon. **The relations between the reducing powers of bacteria and their capacity for forming peroxide.** Jour. Path. and Bact. 28: 155–164. 1925.—The necessary consequence of bringing a reducing mechanism into contact with O_2 is the production of H_2O_2. All bacteria possess a reducing mechanism, though marked variation among the different species occurs. All bacteria which possess an active reducing mechanism, and are devoid of catalase can be shown to produce H_2O_2, or the green discoloration of "chocolate agar" characteristic of that substance. The amount of H_2O_2 produced is necessarily limited by the sensitiveness of the bacteria to that substance. A close parallelism is seen to exist between the reduction of glutathione, the dissolving of cystine and the production of H_2O_2 by bacteria, provided the influence of catalase and of sensitiveness to H_2O_2 in controlling the production of that substance is taken into account. If the green color in "chocolate agar' is accepted as evidence of H_2O_2 production all 3 phenomena can be explained by the supposition that the bacteria generate active hydrogen.—*E. M. A. Enlows.*

9473. Nelson, J. M., and Oscar Bodansky. **Mutarotation as a factor in the kinetics of invertase action.** Jour. Amer. Chem. Soc. 47: 1624–1638. 1925.—The invert sugar formed by the hydrolysis of sucrose by invertase exerts a retarding influence on the velocity of the reaction. The retarding effect of invert sugar on the rate of hydrolysis is according to whether it is freshly liberated or whether it was mutarotated. In 8, 10 and 12% sucrose solutions where the amount of sucrose left is greater then 4 to 5 gm. the retardation of the unmutarotated invert sugar is less than the mutarotated, while where the sucrose is less than 4–5 gm. the retardation of the unmutarotated invert sugar is greater than that of the mutarotated. During the hydrolysis of a 10% sucrose solution there are 2 simultaneous and continuous reactions going on, the hydrolysis of the sucrose present and the mutarotation of the invert sugar formed.—*J. M. Brannon.*

9474. Neuberg, C. **Einige Beobachtungen über Hefefermente. [Observations on yeast enzymes.]** Biochem. Zeitschr. 152: 203–206. 1924.—Dry yeast or acetone yeast tested for carboxylase content is recommended for demonstration of decarboxylation of pyruvic acid. Dried yeast loses zymase activity and can be used to differentiate zymase and carboxylase. Macerated yeast sap can be used to demonstrate the absence of heat liberation during pyruvic acid fermentation. Invertase prepared by autolysis of pressed yeast maintained its activity 4,400 days.—*H. D. Hooker.*

9475. Neuberg, C., und G. Gorr. **Neue Untersuchungen über die Vergärung der Oxalessigsäure. [The fermentation of oxalacetic acid.]** Biochem. Zeitschr. **154:** 495–502. 1924.—Oxalacetic acid was fermented by yeast to acetoin, malic acid and β, γ-butylene glycol, as well as to acetaldehyde and CO_2.—*H. D. Hooker.*

9476. Neuberg, C., und A. Gottschalk. **Erfahrungen über die Vergärung des Dioxyacetons. [The fermentation of dihydroxyacetone.]** Biochem. Zeitschr. **154:** 487–491. 1924. —The ability of yeasts to ferment dihydroxyacetone varied at different times for the same yeast, though hexose fermentation was constant. Phosphate had no beneficial action.—*H. D. Hooker.*

9477. Neuberg, C., und M. Kobel. **Zur Frage der künstlichen und natürlichen Phosphorylierung des Zuckers. [Artificial and natural phosphoration of sugar.]** Biochem. Zeitschr. **155:** 499–506. 1925.—Complete phosphoration by yeast occurred at pH 8.4–7.85 in the presence of KCN.—*H. D. Hooker.*

9478. Neuberg, C., und E. Simon. **Zur Kenntnis der biochemischen Acyloinsynthese. VIII. Mitteilung über Carboligase. [Biochemical synthesis of acyloin. Carboligase.]** Biochem. Zeitschr. **156:** 374–378. 1925.—Sugar is essential for the synthesis of acyloin by carboligase, giving rise to nascent acetaldehyde.—*H. D. Hooker.*

9479. Ogawa, I. **Das fettspaltende Ferment der Takadiastase. [The lipolytic enzyme of Taka-diastase.]** Biochem. Zeitschr. **149:** 216–227. *8 fig.* 1924.—The rate at which tributyrin was hydrolysed by Taka-diastase was studied from pH 6.0–12.7. Phosphate, glycin and borate were used as buffers. Borates were toxic, though having no toxic action on gastric or serum lipase. Quinine, KCN and NaFl showed little toxic action; atoxyl was slightly toxic.—*H. D. Hooker.*

9480. [Palladin, V. I., and E. M. Popova.] Палладин, В. И., и Е. М. Попова. **к вопросу об образовании диастаза в растениях. [On the origin of diastase in plants.]** Труд по прикладной Ботанике и селекцин. Bull. Appl. Bot. & Plantbreed. **13:** 355–369. 1922–1923 [1924].—Several experiments were performed on the leaves of *Robinia Pseudacacia, Ricinus communis, Allium fistulosum* and *Beta vulgaris*. The leaves were removed from the plants and subjected to autolysis. Diastase in leaves occurs in combination with the protoplasts. The nature of the combination is not known. The diastase can function only when it is free from the protoplast. Active diastase is a product of the disintegration of the protoplast. In killed leaves the disintegration of the protoplasts and the formation of the free diastase occurs during autolysis, while in living leaves diastase is formed in darkness (during starvation), simultaneously with the formation of other nitrogenous products resulting from the disintegration of albumens. Leaves cultivated on sugar media show an inhibition of the disintegration of albuminous substances and at the same time show an inhibition of diastase formation. Acids also inhibit the separation of diastase from the protoplast. Enzymes in living cells occur in combination with the protoplasts and are constantly freeing themselves from the protoplast for enzymatic activities. During sap formation, cells disintegrate producing autolysis resulting in an accumulation of a large amount of free enzymes, which bring about vigorous fermentation.—*L. J. Pessin.*

9481. Rona, P., und C. van Eweyk. **Eine neue Methode zur Untersuchung der Amylase. [A new method of investigating amylase.]** Biochem. Zeitschr. **149:** 174–187. *13 fig.* 1924.—The action of saliva on glycogen is measured by determining the concentration of glycogen with a nephelometer.—*H. D. Hooker.*

9482. Rosenfeld, L. **Über die Koagulierende Eigenschaft des Papayotins. [The coagulating property of papain.]** Biochem. Zeitschr. **149:** 158–173. 1924.—Papain flocculates an aqueous solution of the mucilage from *Cydonia* seed since papain is a positive colloid and the mucilage, negative. Papain was recovered from the precipitate by treatment with alkali. The precipitate coagulates milk. Flocculation is prevented by serum because of its globulin content. Agar solutions were also flocculated. Alkalis, inorganic acids and neutral salts inhibit flocculation, organic acids favor it.—*H. D. Hooker.*

9483. Rosenfeld, L. **Über das Verhalten der Urease gegen Alkohol. [The properties of urease in alcohol.]** Biochem. Zeitschr. **154:** 141–142. 1924.—Jack-bean urease was decreasingly soluble in increasing concentrations of alcohol, only traces dissolving in 98%.—*H. D. Hooker.*

9484. Rosenfeld, L. **Über die Bindung der Auxoureasen an das Enzym. [The combination of auxo-ureases with the enzyme.]** Biochem. Zeitschr. 154: 143–147. 1924.—Potassium cyanide and glycin, the auxo-bodies of urease, combined with the enzyme or with the enzyme complex.—*H. D. Hooker.*

9485. Rosenfeld, L. **Über die phytochemische Reduktion des α, α, β-Trichlorbutylaldehyds zum 2,2,3-Trichlorbutanol. [Phytochemical reduction of α, α, β-trichlorbutyl aldehyde to 2,2,3-trichlorbutyl alcohol.]** Biochem. Zeitschr. 156: 54–57. 1925.—Butyl chloral hydrate added to fermenting yeast was reduced to trichlorbutyl alcohol.—*H. D. Hooker.*

9486. Santomauro, P. **Über die phytochemische Reduktion des Methyl-α-chlor-äthylketons. [Phytochemical reduction of methyl α-chlorethyl ketone.]** Biochem. Zeitschr. 151: 48–50. 1924.—Methyl α-chlorethyl ketone was reduced by yeast to chlorbutyl alcohol.—*H. D. Hooker.*

9487. Schimizu, K. **Zur Kenntnis der Wirkung von Pflanzensekretinen auf das Pankreas. [The action of plant secretins on the pancreas.]** Biochem. Zeitschr. 149: 556–559. 1924.—Acid hydrolysis of spinach, nettle and onion yielded a substance that stimulated pancreas secretion when administered to a dog having stomach and duodenum disconnected.—*H. D. Hooker.*

9488. Schmidt, D. **Über die Pilzstärke (Amylose) bei Aspergillus niger v. Tgh. und einige Bemerkungen über ihren diastatischen Abbau. [Amylose of Aspergillus niger v. Tgh. and its diastatic hydrolysis.]** Biochem. Zeitschr. 158: 223–252. *2 fig.* 1925.—The polysaccharide of *Aspergillus niger* that stains blue with I was found to be amylose. Glycogen was absent. Amylose formation in fungi ran parallel with acid formation. The C:N ratio is important, as amylose formation increased as the N decreased in proportion to carbohydrate. Amylose is formed by enzymatic action, perhaps from paradextran (fungose). Diastases of fungi and bacteria and acid treatment led to the formation of substances giving a red color with I. When amylose was hydrolyzed by emulsin, malt or pancreatic diastase, the blue color with I disappeared.—*H. D. Hooker.*

9489. Schmidt, J. J. **Zur Biologie der Tabaksfermentation. [The biology of tobacco fermentation.]** Tropenpflanzer 28: 64–68. 1925.—The work of various investigators is reviewed; some consider fermentation (1) a chemical process caused by oxygen of the air (Bockhout and Otto de Vries), (2) an enzymatic process, especially by oxydase, peroxydase and catalase (Oskar Loew), (3) a biological process caused by microörganisms (Suchsland, Behrens, Koning and Vernhout). The writer found that during tobacco fermentation, a development of microörganisms, which were already found on the green leaves, takes place. Not all species develop equally; there is a selection among certain groups, depending upon temperature. The flora of tobacco of different origins and quality is different in number and kinds of species of microörganisms. There are no differences in number of species between German tobacco and that of other countries, when fermented in the same way. Species of microörganisms found on tobacco from other countries were not present on German tobaccos, although they belong to the same groups of bacteria. Differences in number and kinds of species occur on tobacco fermented in different ways. Organisms isolated were cocci, fluorescent species, short rods, spore producers, and relatives of *Bacillus mycoides*, *B. megatherium*, and mesentericus species. Plectridia and Clostridia were obtained from tobacco of bad quality. Bacteria from different tobacco species behave differently in relation to albumen and carbohydrates. Mesentericus species act quickly, whereas cocci decompose albumens slowly. Organisms apparently related to *Bacillus mycoides* and *B. megatherium* very rapidly decompose albumen and carbohydrates.—*J. C. Th. Uphof.*

9490. Sen, H. K. **Die biochemische Umwandlung von unsymmetrischem Di-chlor-aceton in optisch-aktiven α,α-Di-chlor-iso-propyl-alkohol. [Biochemical conversion of asymmetric dichloracetone to optically active α,α-dichlorisopropyl alcohol.]** Biochem. Zeitschr. 151: 51–53. 1924.—Yeast reduced asymmetric α,α-dichloracetone to levorotatory α,α-dichlorisopropyl alcohol.—*H. D. Hooker.*

9491. Standenath, F. **Über den Einfluss von Lecithin, Cholesterin und Cholesterinderivaten auf die tryptische Verdauung. [The influence of lecithin, cholesterol, and cholesterol derivatives on tryptic digestion.]** Biochem. Zeitschr. 155: 245–246. 1925.—Lecithin greatly retarded trypic digestion. Cholesterol and its derivatives had no effect.—*H. D. Hooker.*

9492. STÄRKLE, M. **Die Methylketone im oxydativen Abbau einiger Triglyceride (bzw. Fettsäuren) durch Schimmelpilze unter Berücksichtigung der besonderen Ranzidität des Kokosfettes. I. Die Bedeutung der Methylketone im Biochemismus der Butterranzidität. II. Über die Entstehung und Bedeutung der Methylketone als Aromastoffe im Roquefortkäse. [Methyl ketones in the oxidative decomposition of triglycerides or fatty acids by molds, with reference to the rancidity of coco fat. The significance of methyl ketones in the biochemistry of butter rancidity. The origin and significance of methyl ketones as aromatic substances in Roquefort cheese.]** Biochem. Zeitschr. **151:** 371–415. *1 fig.* 1924.—The odor of rancid coco butter is due to methyl ketones. Methylundecyl ketone, previously reported, was not found. Methylamyl ketone, not previously reported, was found. These ketones were produced by *Aspergillus* and *Penicillium* in the presence of water and nitrogenous substances. The fungus hydrolyzes the fats and simultaneously produces NH_3; NH_3 salts are formed that become oxidized to ketones. In pure culture *Penicillium glaucum* converted free fatty acids, their NH_3 salts and the pure triglycerides to the corresponding ketone. Caproic, caprylic, capric, lauric, œnanthic and pelargonic acids gave methyl ketones. Ketone rancidity is distinguished from aldehyde rancidity resulting from the oxidation of oleic acid in light and air. The rancidity of butter is a ketone rancidity not an ester rancidity. The aroma of ripe moldy Roquefort cheese is attributed to methyl ketones and not to butyric esters.—*H. D. Hooker.*

9493. SYNIEWSKI, V. **Untersuchungen über Diastase I. Über die Nichteinheitlichkeit der Gerstenmalzdiastase. [The heterogeneity of malt diastase.]** Biochem. Zeitschr. **158:** 87–120. *2 fig.* 1925.—Malt diastase is thought to contain both α- and β-diastase, as it behaves similarly to an artificial mixture of the two. Diastase breaks the bonds limiting maltose to the rest of the starch molecule, yielding maltose and a dextrin that turns blue with I. It was destroyed by heating for 20 minutes at 60°C. β-Diastase breaks the bonds uniting the glucose radicles in the dextrin residue. Its action changes the color with I from blue to red and brown until it finally disappears. This enzyme was destroyed at 80°C. Barley contains α-diastase only, with proteins adsorbed, which must be removed by proteolysis for complete extraction. β-Diastase arises during malting and can be extracted completely with water. At the same time, some α-diastase disappears and may be oxidized to become β-diastase. Proteolysis prevents β-diastase formation. Malt probably contains less diastases than the fresh grain. The diastatic activity of the combined diastases is greater than the sum of their separate activities.—*H. D. Hooker.*

9494. VERKADE, P. E. **Over de aantastbaarheid van organische verbindingen door micro-organismen. II. De oplosbaarheid van enkele organische zuren in vette olien. [Susceptibility of organic compounds to micro-organisms. II. The solubility of some organic acids in fatty oils.]** Verslag. K. Akad. Wetenschapp. Amsterdam **29:** 401–408. 1920.

9495. WARBURG, O. **Über Eisen, den sauerstoffübertragenden Bestandteil des Atmungsferments. [Iron as the oxygen-carrying constituent of oxidases.]** Biochem. Zeitschr. **152:** 479–494. *2 fig.* 1924.—Oxidases are defined as the sum of all the catalytically active iron compounds that occur in the cell. In a broader sense H_3PO_4 might be included.—*H. D. Hooker.*

9496. WILLSTÄTTER, RICHARD, UND RICHARD KUHN. **Über Spezifitat der Enzyme. I. Zur Theorie der Zeitwertquotienten. [Time value quotient.]** Zeitschr. Physiol. Chem. **125:** 1–27. 1923.—Enzymatic reactions can be influenced in various ways and these influences can be determined by kinetic measurements. As long as we know enzymes only by their action, it is necessary to study the influence of "Enzymebegleiter" and to reduce them to definite types. If this is done we are able to obtain a measure of the quality of the enzyme and its specific nature by merely determining the reaction velocity. The time value quotient becomes a function of the substrate concentration. Impurities change the activity of an enzyme differently depending on the affinity to the substratum and it is necessary to study the dependence of the time value quotient from the substrate concentration whereby we assume that substrate and enzyme union is regulated by the law of mass action. The time value quotient is also a measure of the specificity of an enzyme. If enzyme preparations agree in their affinity for one substrate they must agree likewise for a second substrate, so that the relation of reaction-velocity will always remain the same. If the affinity for one is changed, the affinity for the other is also changed and the time value quotient shifts. The law which unites the 2 affinity constants is regulated by the mechanism of the action of impurities.—*E. Artschwager.*

9497. Willstatter, Richard, und Richard Kuhn. **Über Spezifitat der Enzyme. II. Saccharase und Raffinasewirkung des Invertins. [Action of invertase upon sucrose and raffinose.]** Zeitschr. Physiol. Chem. **125:** 28–92. *Fig. 1-a–17-b.* 1923.—The molar relation of saccharase and raffinase is the same for each invertin and is independent of the changing amount of the time value quotient; thus, the invertin of the common yeasts is able to act on cane sugar as well as on raffinose.—*E. Artschwager.*

9498. Wyss, Fernand. **Contribution à l'Etude de la Tyrosinase (Tyrosinase).** Univ. Geneve These **693:** 1–52. Imprimerie Jent: Geneve, 1922.—The presence of tyrosinase in a number of fungi was determined. The activity of tyrosinase from fungi on tyramine was studied. It is better to use a product purified by precipitation by alcohol both in the case of the tyrosinase of fungi and of potato. The optimum H-ion concentration for tyrosinase is pH 6.2. Repeating the experiments of Haehn, the so-called coferment of tyrosinase is found to be a modification of the reaction of the solution. The action of tyrosinase on a variety of amines and phenols is studied. Tyrosinase is an oxidizing enzyme able to act on compounds of different chemical constitution included in the amines, acid amines and phenols. It therefore acts on the decomposition products of the proteins.—*Author (translated).*

METABOLISM (RESPIRATION, AERATION)

9499. Cerighelli, R. **Nouvelles recherches sur la respiration de la racine.—Variation du quotient respiratoire au cours du developpement. [New investigations on the respiration of the root.—Variation of the respiratory quotient in the course of development.]** Rev. Gén. Bot. **37:** 102–112, 157–166. 1925.—Wounds have an influence on the respiratory quotient, but this influence is not always exerted in the same way. Sometimes the quotient diminishes, sometimes it increases, if the trials are made immediately after wounding. In general it seems that the quotient tends to approach unity. The temperature between the limits of 12–24°C. exerts an influence on the respiratory quotient of fleshy roots only or of those rich in reserve materials. The value of the respiratory quotient is indirectly related to the quantity of reserve material contained in the root. At the beginning of their development roots have a quotient, usually less than unity. They are then poor in reserve materials. The roots of annual plants, poor in reserve materials preserve during their entire growth a quotient of less than unity. Roots which accumulate reserve materials have a quotient greater than unity.—*J. C. Gilman.*

9500. Fox, H. Munro. **On Chlorocruorin. 1.** Proc. Cambridge Phil. Soc. Biol. Sci. **1:** 204–217. *Fig. 8.* 1924.—Chlorocruorin, the red-green pigment dissolved in the blood of certain polychaete worms, exists in an oxidised and a reduced form, which have different absorption spectra. Chlorocruorin is a respiratory pigment in that the oxidized form can be reduced (a) by a vacuum, and (b) by living tissue, and then reoxidized by air. Blood of *Spirographis*, containing chlorocruorin, gives off on the addition of potassium ferricyanide $\frac{1}{3}$ the volume of gas given off by human blood. The absorption bands of oxychlorocruorin and reduced chlorocruorin resemble those of oxy- and reduced haemaglobin shifted towards the red end of the spectrum. The oxychlorocruorin spectrum differs from that of oxyhaemoglobin in the relative heights of the α and β bands and in the presence of a 3rd much smaller band. The band of reduced chlorocruorin has a summit with a buttress on either side, thus differing from the simple summit of the mammalian and the double apex of the *Arenicola* haemoglobin band. The spectra of metachlorocruorin and chlorocruorohaematin differ considerably from those of methaemoglobin and haematin. Chlorocruorochromogen closely resembles haemochromogen spectroscopically. The bands of the former are further towards the red than those of the latter, but the shift is less than in the case of oxy- and reduced chlorocruorin relative to oxy- and reduced haemoglobin. A porphyrin has been prepared from chlorocruorin.—*Author.*

9501. Fürth, O. **Vermag das Insulin die assimilatorische oder dissimilatorische Tätigkeit mit Luft geschüttelter Hefe zu beeinflussen? [Does insulin affect the metabolism of** aerated yeast?] Biochem. Zeitschr. **150**: 265–270. 1924.—Insulin had no appreciable effect on aerated yeast with respect to CO_2 production, sugar consumption or the accumulation of glycogen and yeast gum.—*H. D. Hooker.*

9502. Glaser, E., und L. Wittner. **Über die blutzuckerherabsetzende Wirkung von Pflanzenextrakten und Oxydasen sowie den Nachweis von Fermenten im Insulin. [Decrease of blood sugar induced by plant extracts and oxidases and the presence of enzymes in insulin.]** Biochem. Zeitschr. **151**: 279–295. 1924.—The blood sugar of rabbits was decreased by peroxidases of horse-radish, tyrosinase from mushrooms, catalase of sheep's liver. Peroxidase and aldehydase were found in insulin. The activity of these enzymes and of insulin was destroyed by boiling, by mineral acids and by tryptic digestion.—*H. D. Hooker.*

9503. Kinbrough, W. D. **The relation of respiration to storage and transportation of Irish potatoes.** Proc. 11th Ann. Meeting, Potato Assoc. America **1924**: 53, 54. 1925.—The respiration rate may be injuriously high at 2 periods in the storage life of potatoes, just after digging in the fall, and when potatoes stored at low temperatures are exposed to higher temperatures. The respiration rate was determined at 86, 72 and 63°F., for tubers that had been held for varying periods at 32, 36, 40 and 72°F. The lower the temperature of the storage the higher the initial rate of respiration when exposed to warmer temperatures. It was also found that the initial respiration rate was higher, the longer the tubers had been in storage, up to 3 weeks. A longer storage period did not further increase the respiration rate.—*J. T. Rosa.*

9504. Kostytschew, S. **Pflanzenatmung. [Plant respiration.]** *vii + 152 p. Fig. 10.* Julius Springer: Berlin, 1924.—This is Vol. 8 of the series: "Monographien aus dem Gesamtgebiet der Physiologie der Planzen und der Tiere." The chapter headings, translated, are as follows: Oxygen respiration; anaerobic respiration; the relation of oxygen respiration to anaerobic respiration; the chemical processes of plant respiration; respiration at the expense of mineral substances, including a discussion of nitrifying bacteria, sulphur bacteria, iron bacteria, hydrogen bacteria, and others.—*C. S. Gager.*

9505. Marian, J. **Die Assimilation des Glycerins durch sauerstoffgeschüttelte Hefe. [Glycerol assimilation by aerated yeast.]** Biochem. Zeitschr. **150**: 290–303. 1924.—Glycerol was assimilated by aerated yeast without CO_2 evolution. Assimilation depended on the presence of O_2 but was independent of glycerol concentration. Readily hydrolyzable carbohydrate increased, but fat and protein contents were not affected.—*H. D. Hooker.*

9506. Meyerhof, O., und K. Matsuoka. **Über den Mechanismus der Fructoseoxydation in Phosphatlösungen. [The mechanism of fructose oxidation in phosphate solutions.]** Biochem. Zeitschr. **150**: 1–11. *6 fig.* 1924.—The oxidation of fructose in concentrated PO_4 solutions is a metallic catalysis, greatly retarded by KCN and sodium pyrophosphate and accelerated by Cu, Fe, and Mn. Arsenates may be substituted for the PO_4.—*H. D. Hooker.*

9507. Morinaga, Toshitaro. **Catalase activity and the aerobic and anaerobic germination of rice.** Bot. Gaz. **79**: 73–84. 1925.—Dry seed of rice were found to contain about 0.1 as much catalase as dry seed of wheat, oats, barley and rye. In rice germinating aerobically the amount of catalase increased markedly and finally became about 0.7 as great as in the other seedlings. Increase of catalase was retarded when germination occurred under conditions of reduced O_2 pressure and was entirely inhibited in complete absence of O_2. Most plumule growth and least radicle elongation occurred under conditions of reduced O_2 pressure. Growth begun under aerobic conditions continued during anaerobiosis, but catalase activity decreased. Seedlings which had germinated anaerobically absorbed less O_2 and gave off less CO_2 when transferred to aerobic conditions in the respirometer than did seedlings which had germinated aerobically.—*S. G. Lehman.*

9508. Neuberg, C., und A. Gottschalk. **Beobachtungen über den Verlauf der anaeroben Pflanzenatmung. [The course of anaerobic respiration in plants.]** Biochem. Zeitschr. **151**: 167–168. 1924.—Pea seed produced acetaldehyde from glucose in the presence of calcium sulphite; O_2 was excluded. The seed were 1st washed in $HgCl_2$, ground coarsely and a stream of O_2-free H_2 was passed through the solution.—*H. D. Hooker.*

9509. Sierakowski, S., und R. Zajdel. **Über die Rolle des Kohlensäureanhydrids in Bakterienkulturen. [The role of carbon dioxide in bacterial cultures.]** Biochem. Zeitschr. **152**: 111–115. 1924.—Air-tight sugar-free *B. coli* cultures developed a pH value of 6.7 whether acid or basic in the beginning. The CO_2 produced in respiration is in equilibrium with carbonate ions at this point.—*H. D. Hooker.*

9510. Stephenson, M., and M. D. Whetham. **Studies in the fat metabolism of the timothy grass bacillus. II. The carbon balance-sheet and the respiratory quotient.** Proc. Roy. Soc. London B 95: 200–206. *Fig. 1–5.* 1923.—During periods of growth of the organism studied the output of CO_2 was at first high, then low, in relation to O_2 uptake. This gives a respiratory quotient which in the beginning is > 1, later < 1. These results confirm earlier findings, based upon fat analysis, that when the glucose of the medium is used up in respiration or in protein and lipoid synthesis the lipoid materials are consumed in respiration.—*P. B. Sears.*

9511. Szent-Györgyi, A. v. **Studien über die biologische Oxydation. III. Über das Oxyd der SH-Gruppe und über die Oxydation durch Athylperoxyd. [Biological oxidation. The oxide of the SH group and oxidation with ethyl peroxide.]** Biochem. Zeitschr. 149: 188–190. 1924.—Oxidation of the SH group does not yield a peroxide or a hydroperoxide. The following were oxidized with ethyl peroxide: glycero-phosphoric acid, formic, acetic, glycolic lactic, α-butyric, malic, tartaric, citric, and pyruvic acids. Methyl and ethyl alcohol, glycol, glycerol, formaldehyde, acetaldehyde, glucose, acetone, and propionic, β-butyric, oxalic, malonic, and succinic acids were not oxidized.—*H. D. Hooker.*

9512. Szent-Györgi, A. v. **Über den Mechanismus der Succin- und Paraphenyldiaminoxydation. Ein Beitrag zur Theorie der Zellatmung. [The mechanism of succinic acid and paraphenyldiamine oxidation. A contribution to the theory of cell respiration.]** Biochem. Zeitschr. 150: 195–210. *5 fig.* 1924.—Oxidation of succinic acid is considered to depend on a double mechanism involving the activation of both H_2 and O_2; H_2 activation would play no part in the oxidation of paraphenyldiamine.—*H. D. Hooker.*

9513. Tanaka, K. **Versuche zur Prüfung der Wielandschen Atmungstheorie. [Experiments to test Wieland's theory of respiration.]** Biochem. Zeitschr. 157: 425–433. *1 fig.* 1925. —The formation of H_2O_2 during respiration by *Chlorella* in the dark could not be detected, although it was found during photosynthesis. Decomposition of H_2O_2 by *Chlorella* was inhibited by 0.01 N HCN, but respiration was accelerated.—*H. D. Hooker.*

9514. Terroine, Emile F., S. Trautmann, R. Bonnet, et R. Jacquot. **L'energie de croissance. III. Rendements energetiques compares dans le developpement de moisissures sur divers aliments organiques et mecanisme de l'action dynamique specifique. [The energetics of growth. III. Comparative energy yields of various organic food stuffs for the development of molds and the mechanism of specific dynamic action.]** Bull. Soc. Chim. Biol. 7: 351–379. 1925.—In previous papers of the series, Terroine and Wurmser (Bot. Absts. 13, Entry 3088) and Terroine, Bonnet and Joessel (Bot. Absts 13, Entry 7968) have developed the idea that if Rubner's theory of the specific dynamic action of food stuffs is correct, it is a physico-chemical law applying to plants as well as to animals. In the present work, *Aspergillus Orhizae* and *Sterigmatocystis nigra* were grown from spores in liquid media containing a single nutrient substance. Various amino acids, peptone, gelatin, glucosamine hydrochloride and dextrose were employed. The methods employed by Terroine and Wurmser were used in determinations of the total initial energy of the medium, the residual energy after growth ceased, that of the mycelium, and that represented by the CO_2 evolved during growth. The method is accurate to within 5%. In the case of dextrose the energy yield (calorific value of mycelium: calorific value of nutrient material consumed during growth) was 58%; in the case of gelatin, peptone, glycocoll, asparagine, alanine, valine, leucine, glutamic acid, and glucosamine hydrochloride it was 39%. The loss of energy occurring in the utilization of nitrogenous compounds, whether simple or complex, is constant. This indicates that the loss is due to deamination, and that the deaminized products are directly utilized without prior conversion into dextrose. Specific dynamic action in homeotherms is strictly limited to the loss of energy resulting from deamination.—*Joseph S. Caldwell.*

ORGANISM AS A WHOLE

9515. Anonymous. **The feeding of plants with especial reference to lawns.** Missouri Bot. Gard. Bull. 13: 26–36. 1925.—A reprint of an article in the Bulletin of the Garden Club of America, Nov., 1924, and Jan., 1925.—*O. T. Wilson.*

9516. Bálint, M. **Ein Beweis für die Konstanz der $[H^{\cdot}]$ der lebenden Bakterienzelle. [Proof of the constancy of hydrogen ion concentration in living bacteria.]** Biochem. Zeitschr. **152:** 91–93. 1924.—*Staphylococcus* grown for 5 weeks in a medium of pH 3.5 maintained a H-ion concentration between 7 and 8 as shown by litmus and rosolic acid.—*H. D. Hooker.*

9517. Dieterich, Karl. **Über Kultur von Embryonen ausserhalb des Samens. [The culture of embryos outside of the seed.]** Flora **117:** 379–417. *Pl. 4–6.* 1924.—Embryos from representatives of various families (Cruciferae, Leguminosae, Cucurbitaceae, Linaceae, Solanaceae, Polygonaceae, Gramineae) were removed from the seed when partly developed and raised successfully. These do not require a resting period, but it is necessary for the embryos of certain other plants (*Ipomoea, Althaea*). A colloidal culture medium (agar) corresponds most closely to the natural conditions. Inorganic nutrient solutions used alone were not satisfactory. A medium containing 2.5–5% cane sugar, the mineral component of an inorganic solution such as Knop's and 1.5% agar was found to be most favorable. Embryos removed when less than ½ their final size were not found to grow independently; the embryos of grasses reach a state of independence earlier than the others. As soon as the embryo can live independently it is capable of geotropic response. Experiments indicate that the curving in the embryos of the Cruciferae is induced.—*A. G. Stokey.*

9518. Kondo, S. **Der Verwendungsstoffwechsel säurefester Bakterien. III. Die Nahrungsbedürfnisse des Hühnertuberkelbazillus; sein Wachstum beim Aufbau aus einfachen chemischen Verbindungen. [Nutrition of acid-fast bacteria. Nutritive requirements of tuberculosis bacilli of poultry; their growth in a synthetic medium.]** Biochem. Zeitschr. **153:** 302–312. 1924.—Tuberculosis bacilli of poultry were able to use acetic acid and to a slight extent glycerol as a source of C. Formic, propionic, butyric, oxalic, lactic, succinic, malic, tartaric and citric acids, methyl, ethyl and amyl alcohols, mannit, glucose, fructose and arabinose were not used; NH_3, NO_3, glycin, alanin, aspartic acid, leucin and tyrosin were used as a source of N when acetates were present. The amino acids did not serve as a source of both N and C. Urea was not used.—*H. D. Hooker.*

9519. Kondo, S. **Der Verwendungsstoffwechsel säurefester Bakterien. IV. Der Verwendungsstoffwechsel der Tuberkelbazillen des Typus humanus und Typus bovinus. [The assimilation of acid-fast bacteria. The assimilation of human and bovine tuberculosis bacilli.]** Biochem. Zeitschr. **155:** 148–158. 1925.—Human and bovine tuberculosis bacilli used acetic acid, glycerol and glucose as a source of C and ammonia, alanin, aspartic acid, leucin and urea as a source of N. Glycin was used by the bovine type as a source of N.—*H. D. Hooker.*

9520. Marian, J. **Über das Verhalten sauerstoffgeschüttelter Hefe zu β-Oxybuttersäure. [The behavior of aerated yeast to β-hydroxybutyric acid.]** Biochem. Zeitschr. **150:** 281–289. 1924.—The Na and NH_3 salts of β-hydroxybuytric acid were not oxidized or assimilated by yeast.—*H. D. Hooker.*

9521. Raabe, Henryk. **Sur l'influence de certains facteurs dans le developpement du flagellé Prowazekia (Bodo) edax. [The influence of certain factors on the development of the flagellate, Prowazekia edax.]** Bull. Soc. Chim. Biol. **7:** 383–400. 1925.—Cultures of the protozoan originally derived from a single individual were grown in nutrient bouillon, adjusted to various initial pH concentrations and the rate of multiplication and time elapsing before cessation of division and death of the organisms were compared. Initial pH concentration, concentration of nutrients, and ratio of surface of culture to its volume can be so adjusted as to increase multiplication rate and prolong the life of the culture, but only within rather narrow limits. Accumulation of non-volatile decomposition products in the medium is the decisive factor in limiting both multiplication rate and duration of life.—*Joseph S. Caldwell.*

9522. Schnücke, R. **Der Phosphorstoffwechsel einiger Pilze, mit besonderer Berücksichtigung von Aspergillus niger. [The phosphorus metabolism of certain fungi, especially Aspergillus niger.]** Biochem. Zeitschr. **153:** 372–423. 1924.—Phosphorus absorption by *Aspergillus niger* was rapid at first, the percentage content of the young mycelium being high. Absolute P content increased to a maximum, remained constant for a time and then decreased, due to excretion of inorganic PO_4. The more rapid the development, the faster the decrease. Production of dry matter in large amounts lowered the absolute and relative

P content, but excretion occurred, and somewhat sooner than normally. Relative P content, was not particularly affected by variation in the supply of P or N except that increased NO_3 increased the absolute and relative P content. The P of the cells was used in spore formation, being translocated within the cell to the region of utilization. Old mycelia contained more P when spores were present. No excretion of P was found in *Oidium lactis*, *Penicillium WII* or *Dematium pullulans;* the P content increased or remained constant to the end. The decrease in *Aspergillus* is attributed to enzyme activity. Nitrogen varied parallel with P and excretion occurred, though in less degree. The P-N ratio was not constant.—*H. D. Hooker.*

9523. Supniewski, J. **Untersuchungen über den Stoffwechsel der Kohlenstoffverbindungen bei Bacillus pyocyaneus. [The carbon metabolism of Bacillus pyocyaneus.]** Biochem. Zeitschr. **154**: 90–97. 1924.—*Bacillus pyocyaneus* used CO_2, lactic acid, glycerol, ethyl alcohol, acetaldehyde and acetic acid and glucose as a source of C.—*H. D. Hooker.*

GROWTH, DEVELOPMENT, REPRODUCTION

9524. Anonymous. **Factors influencing growth in trees and plants.** Nature **115**: 550–551. 1925.—This refers to publications by MacDougal, Shreve and Nakashima.—*O. A. Stevens.*

9525. Brink, R. A. **The influence of hydrogen-ion concentration on the development of the pollen tube of the sweet pea (Lathyrus odoratus).** Amer. Jour. Bot. **12**: 149–162. *4 fig.* 1915.—The author describes his 2 methods of adjusting pH, by KOH and H_3PO_4; and by KOH and HCl in a 3% solution of gelatin. The latter method proved more useful. Highest germination was secured at pH 7.0, although the optimum is not sharply defined. The zone of H-ion concentration for pollen-tube growth is in the vicinity of pH 6.0 and is relatively narrow. The suggestion is offered that the H-ion concentration may modify pollen-tube growth through a direct effect upon the chemical reactions attending the digestion of the reserve food materials.—*E. W. Sinnott.*

9526. Fox, H. M. **Lunar periodicity in reproduction.** Proc. Roy. Soc. London B **95**: 523–550. *Fig. 1–4.* 1924.—In addition to considerable data on animal reproduction the subject of lunar effects on plant reproduction is reviewed. Measurements of cucurbit growth, popularly supposed to be very sensitive to moonlight, show no correlation. Attempts to measure photosynthetic activity of *Elodea* by moonlight show that if any effect exists it is < 0.013 that of sunlight. Measurements with a Savart prism fail to show any appreciable polarization due to reflection of sunlight from the face of the moon itself. It is concluded that moonlight does not differ qualitatively in any significant fashion from sunlight, the difference being a matter of intensity (about 1:600,000).—*P. B. Sears.*

9527. Gericke, W. F. **Growth-inhibiting and growth-stimulating substances.** Bot. Gaz. **78**: 440–445. 1924.—Using glass jars of 6 liters capacity, the author grew successive crops of wheat seedlings in a nutrient solution consisting of equal partial molar concentrations of KH_2PO_4, $Ca(NO_3)_2$ and $MgSO_4$ without renewing the solution or adding nutrients to compensate for removal of salts by successive crops. At the time each crop was removed a new series was started in the original nutrient solution as a basis of comparison. A study of the dry weights of successive crops in the different series showed that the 2nd crop was, with 1 exception, less than that of the 1st, while the 3rd crop was greater than the 2nd and nearly equal to the 1st. The fact that the diminished yield of the 2nd crop is followed by an increased yield in the 3rd crop is taken to show that toxic substances were produced by the 1st crop and that either "a growth stimulating substance was produced by the plants of the second crop which benefited the seedlings" of succeeding crops or "the harmful properties due to the first crop had been rendered innocuous or nearly so by the second crop."—*S. G. Lehman.*

9528. Sherman, H. C., and F. L. Macleod. **The relation of vitamin A to growth, reproduction and longevity.** Jour. Amer. Chem. Soc. **47**: 1658–1662. 1925.

9529. Woodroof, J. G. **The development of pecan buds and the quantitative production of pollen.** Georgia Agric. Exp. Sta. Bull. 144. *133–161. 1 pl., 19 fig.* 1924.—The formation of the catkins within the buds of pecan takes place a year before the catkins are fully developed. The potential differentiation in the pistillate flowers takes place in the early spring. Adventitious buds on the pecan may be latent vegetative buds which have become overgrown. During the months of April and May the nutritive powers of the tree are taxed heavily to support a 4-fold growth and the pecan, being wind pollinated, produces an enormous quantity of pollen, in most cases annually.—*T. H. McHatton.*

MOVEMENTS OF GROWTH AND TURGOR CHANGES

9530. Bose, J. C. **Transmission of stimuli in plants.** Nature **115**: 457. 1925.—This is further comment upon the work of Snow.—*O. A. Stevens.*

9531. Bremekamp, C. E. B. **An hydrotropism and thigmotropism of roots.** South African Jour. Sci. **21**: 258-264. 1924.—After a brief consideration of older methods of demonstrating hydrotropism, the author shows their unappropriateness, as no account is taken of thigmotropism. Sensitiveness to contact was demonstrated by allowing the tips of roots to come into contact with a vertical wall of glass or plaster of Paris. Stiff roots gave maximum curvatures of 30–60° in 12 hours. In the case of thin roots these clung to the wall by means of root hairs but when released curved at once to 45–90°. No reaction occurs when the root tip is separated from the wall by a layer of liquid. The sensitiveness of other parts of the root were demonstrated. Experiments on hydrotropism where thigmotropism was eliminated showed that the reaction was by no means universal and could not be considered a function of ecological importance.—*C. J. Hopkins.*

9532. Raivitscher, Felix. **Epinastie und Geotropismus. [Epinasty and geotropism.]** Zeitschr. Bot. **15**: 65–100. *1 Pl., 3 fig.* 1923.—If all other influences determining direction of growth such as one-sided light and weight were eliminated, shoots of *Tradescantia viridis* declined to about 20° from the vertical while *T. zebrina* showed a bending of 10° only. The shoots are dorsiventral and the dorsal side is always turned up. The angle formed with the vertical by growth results in the shoot having a normal negative geotropism which is determined by the sine law. The dorsal side has a very strong growth tendency (epinasty as described by de Vries) which opposes the geotropism. In the characteristic stationary position of *Tradescantia viridis*, 20° from the vertical, gravity exerts a bending force of G sine 20° which is compensated by epinasty. By G is meant the bending force which the stimulus of gravity exerts on the horizontal shoot. The bending force, in this case due to epinasty, is the same, E. = G. sine 20°. It can be shown that the force due to epinasty retains its value in all situations. Unstable equilibrium does not result if the plant is directed perpendicularly downwards. It again bends to 20° from the vertical, the dorsal side turning up. That the factor opposing negative geotropism is epinasty and not positive geotropism was shown by experiments with Tradescantia sprouts on the clinostat. Negative geotropism only was increased in this case, the epinasty remained the same.—*Author (translated).*

9533. Seubert, E. **Über Chemotropismus bei Avena. [Chemotropism in Avena.]** Biochem. Zeitschr. **150**: 93–100. 1924.—Decapitation of the coleoptile of *Avena sativa* retarded growth. Undiluted saliva in agar applied to the cut surface evenly on all sides stimulated growth. Dilute saliva, diluted sap expressed from Avena cotyledons, sugar and salts retarded growth. Unilateral application produced positive or negative bending.—*H. D. Hooker.*

GERMINATION, RENEWAL OF ACTIVITY

9534. Anonymous. **How long can a seed live?** Missouri Bot. Gard. Bull. **10**: 43–48. 1922.—In a discussion of the subject the writer concludes that 150 years is the longest period authentically recorded for the life of a seed.—*O. T. Wilson.*

9535. Kreysing, Max. **Beitrag zur Keimungsphysiologie des Wiesenschwingels. [Physiology of the germination of meadow fescue.]** Jour. Landw. **72**: 237–278. 1924.—The germination minimum is 4.75°, the optimum 19–24° and the maximum 38°C. Germinating power decreases with age. Freshly harvested seed requires a period of after-ripening and germinates better at higher temperatures. A 3 cm. layer of sand is recommended for the germinating tests. Light aids the germination of young seed but hinders that of old seed. Frost appears to influence germination favorably, $MgCl_2$ and $MnCl_2$ (20% solution), after acting 7–8 hours, stimulates the cells. "Segetan 104 b" shows only a slight stimulating effect —*F. M. Schertz.*

9536. Merkenschlager, F. **Keimungsphysiologie Probleme. [The physiology of germination.]** Naturwissensch. u. Landw. 1: 1–57. 1924.—The resistance of seed and the differences in resistance of seed of different varieties of plants to the following chemical, physical and biological agents are explained on physical-chemical grounds wherever possible: The nitrate ion, acids, H- and OH-ions, Ca, Mg, Al, K, Na, alkaloids and other inorganic and organic poisons, high temperature, low temperature, light, the photodynamic action of fluorescent materials, Röntgen rays and radium emanation, the galvanic stream, gases, starvation, narcosis, age, autotoxins, and infection.—*W. J. Robbins.*

9537. Popoff, Methodi. **Ergebnisse der Feldversuche 1922–23 mit stimulierten Samen. [Results of field experiments with stimulated seed in 1922–23.]** Zellstimulations Forsch. 1: 171–237. 1924.—Exact descriptions of field experiments on about 45 ha. are given in which seed of wheat, rye, oats, barley, rice, corn, millet, beans, tobacco, cotton and various garden plants treated with chemical stimulants were grown. As stimulants salts of Mg, Mn, K, Na, Hg and As, formol, tannin, and various phenol compounds were used. An increase in yield of 25–30% was secured. The significance of the results for agriculture in general is discussed.—*Author (translated).*

9538. Popoff, Methodi, and Georgi Paspaleff. **Experimentelle Zellstudien VI. I Teil. Zur Physiologie des Encystierungsprocesses bei Protozoen. Encystierung und Stimulation. [Cell stimulation studies VI. Part 1. Physiology of the encystment of protozoa encystment and stimulation.]** Zellstimulations Forsch. 1: 39–56. 1924. **II Teil. Encystierung und Stimulation. [Part 2. Encystment and stimulation.]** Zellstimulations Forsch. 1: 129–148. 1924.—A breaking of encystment of *Euglena* resulted from treatment with solutions of the following: $MgCl_2$ and combinations of $MgCl_2$ with $MgSO_4$, $MnSO_4$, $Mn(NO_3)_2$, etc.; alcohol, formaldehyde, chinon, pyrogallic acid + tannin, $MgSO_4$, KCl, KNO_3, KI, KH_2PO_4, potassium arsenate, $CaH_4(PO_4)_2$, $MnSO_4$, $Mn(NO_3)_2$, $FeSO_4$, chloroform, methyl alcohol, formic acid, glycerophosphoric acid, acetone, glucose, phenol, picric acid, strychnine nitrate, nicotine, morphine, pyrocatechin, quinic acid, gallic acid, tannin, tannin + KI, tannin + glycerin, etc. Euglenae, after emerging from encystment moved rapidly and oriented themselves to light.—*M. Popoff (translated).*

9539. Sigmund, W. **Über die Einwirkung von Stoffwechsel-Endprodukten auf den Pflanzen. IV. Einwirkung N-freier pflanzlicher Stoffwechsel-Endprodukte auf die Kiemung von Samen: Harze. Farbstoffe. [The action of nitrogen-free metabolic end products on seed germination: Resins and pigments.]** Biochem. Zeitschr. **154**: 399–422. 1924.—The germination of wheat, vetch and rape was retarded by numerous resins and pigments, such as benzoin, Canada balsam, mastic, storax, myrrh, etc., and alkanna red, logwood, litmus, indigotin, etc.—*H. D. Hooker.*

9540. Tilford, Paul, C. F. Abel, and R. P. Hibbard. **An injurious factor affecting the seeds of Phaseolus vulgaris soaked in water.** Papers Michigan Acad. Sci. 4: 345–356. *Fig. 8.* 1925.—For many seed soaking in water for a definite time before planting leads to better germination, but for other seed this presoaking is injurious. Particularly is this the case with seed of the navy bean, *Phaseolus vulgaris.* If these are soaked in water the latter becomes cloudy and foul smelling in only a few hours. Beans were thus soaked in water in a Mason jar and 100 removed and germinated every 6 hours. The unsoaked seed gave 98% germination, 6 hours reduced it to 95%, 12 hours to 80%, while at the end of 48 hours the germination was only 10%. Beyond that time there was no germination. A similar lot of seed in running water of the same temperature (20°) showed a much more gradual reduction of germination. After 24 hours the germination was 98%, at 117 hours it was 52%, while it was 20% at the close of 144 hours. In a 3rd experiment the seed were carefully sterilized externally and soaked in sterile, stagnant water. No bacterial growth developed, as was proved by platings made at the close of the experiment. The germination fell rapidly to 54% at 50 hours, 25% at 96 hours and 15% at 126 hours. A 4th experiment provided for the aeration of the beans which were 1st sterilized externally. Under these conditions the germination at the end of 72 hours varied from 72 to 100%, while under aerated but non-sterile conditions the germination was 0–40%, the non-aerated, non-sterile seed being dead at that time. The pH was respectively about 6.2, 4.6–7.2, and 4.6–6.9. Each experiment was run several times and the pH varied in these tests for the non-sterile seed. The CO_2 content was respectively 3.4–6.1, 7.9–31.7, and 13.3–20.6. Apparently the presence of bacteria, and the accumulation of CO_2, are the chief factors in the reduction of germination in bean seed thus treated. The leaching out of food matters was not measured in these experiments.—*Ernst A. Bessey.*

9541. Willard, C. J. **The effect of CS_2 on the germination of seeds.** Jour. Econ. Entomol. **16**: 388–392. 1923.—No aeration of storage places is necessary after fumigation with CS_2, whatever dose may be used, unless they are airtight. It required very large doses of CS_2 for a considerable period of time to have any marked effect on the germination of the seed used in this experiment. The injury slowly became greater as the time increased and as the dose increased, but was not directly proportional to either. Seed vary tremendously in their resistance to CS_2 injury. Different varieties of the same species are very differently affected, perhaps due to the pigment in the seedcoat. The first injurious effect of CS_2 on seed is a retardation of germination. Liquid CS_2 poured on most seed in fumigation will not injure them sufficiently to be of practical importance.—*Author.*

REGENERATION, CORRELATION

9542. Bushnell, John. **Variation in vigor of sprouts from quarters of single tubers.** Bot. Gaz. 78: 233–236. *1 fig.* 1924.—Early Ohio potato tubers were quartered along the longitudinal axis. Each piece was planted in a pot in well-mixed soil. Precautions were taken to plant the pieces uniformly. There was marked variation in the time of appearance of the sprouts above the soil from the 4 pieces of the same tuber. Variation in the vigor was also noticeable. The small plants were attached at the tip or near the edge of the seed pieces. The effect of the sprout's position on the seed piece seems to affect the yield.—*L. J. Pessin.*

9543. Herklots, G. A. C. **The effects of an artificially controlled hydrion concentration upon wound healing in the potato.** New Phytol. 23: 240–255. *Pl. IV, 2 fig.* 1924.—From a study of the healing of cut potatoes in media of different H-ion concentration, the necessity of free O_2 for suberisation and meristematic activity is emphasized. Acetates alone in acid buffer solutions prove toxic. All buffer jellies kill at pH below 7.0; the maximum toxicity is at pH 4.2. In buffers more acid than pH 5.0, disintegration of the pectic substances of the middle lamella does not occur. Unsaturated fatty acids are released by cut potato; these are most easily oxidized at low H-ion concentrations. Alkalinity (from pH 7.5) promotes suberisation but retards meristematic activity, while acidity (up to pH 4.6) promotes phellogen activity.—*I. F. Lewis.*

9544. Popoff, M., and W. Gleisberg. **Stecklingsbewurzelung und Pfropfung nach Stimulation. [Stimulation of root and grafting of cuttings.]** Zellstimulations Forsch. **1**: 99–116. 1924.—Immersing twigs of willow, apple, pear, mulberry, and *Cryptomeria* sp. in solutions of Mg and Mn salts, of KBr, etc., produced a significant increase in the rapidity of root production with resulting stronger development.—*M. Popoff (translated).*

9545. Rotunna, N. A. **Effect of size of seed on plant production with special reference to radish.** Bot. Gaz. 78: 397–493. *Fig. 1–4.* 1924.—A summary of preceding work on relation of size of seed to plant production is given. The sieve method was used in separating the seed into the 3 size classes used. The plants were grown in the greenhouse. It was found that when taken as a whole and averaged, the medium seed produced the heaviest root. In certain varieties, however, small seed gave the largest roots; in others, the large. Definite correlation between weight of plants and weight of roots was found.—*B. W. Wells.*

TEMPERATURE RELATIONS

9546. Boresch, K. **Zur Analyse der Frühtreibenden Wirkung des Warmbades. [Analysis of the forcing action of a warm bath.]** Biochem. Zeitschr. **153**: 313–334. *1 fig.* 1924.—Resting buds of *Corylus Avellana*, *Forsythia suspensa*, *Syringa vulgaris*, *Sambucus nigra*, *Robinia Pseudoacacia*, *Tilia parvifolia*, *Acer plantanoides*, *Betula verrucosa*, *Aesculus hippo-*

castanum, Alnus glutinosa, Quercus pedunculata, Ulmus campestris and *Fraxinus excelsior* were forced in a vacuum of 50 mm. mercury at 30°C. as well as in a water bath at 30° for 8 hours. In both cases the O_2 supply was approximately the same. Heat or vacuum alone produced no effect. It was found that the respiration, stimulated by the heat, led to the formation of acids and probably other products of incomplete oxidation in the absence of an adequate O_2 supply. The decreased pH is thought to be a factor in the breaking of the rest period.—*H. D. Hooker.*

9547. Knott, James E. **Effect of cold temperature on growth of vegetables.** Jour. Amer. Soc. Agron., **17**: 54–57. 1925.—Beet and cabbage failed to produce seed stalks the 1st year when germinated at 10°C. and 5°C. respectively or when exposed to 0°C. for ½ the germination period. Depressed temperatures at some period in the growth of biennials rather than low temperatures during germination seem to be the cause of the development of the annual habit.—*F. M. Schertz.*

9548. Newton, Robert. **The nature and practical measurement of frost resistance in winter wheat.** Univ. Alberta, Coll. Agric. Res. Bull. **1**: 1–53. 1924.—In this study the imbibition pressure of fresh leaves, in the winter-hardened condition, as determined by the pressure required to express the tissue fluids, was found to be in most cases directly related to hardiness. In one case an imbibition pressure approximating 600 atmospheres was observed. The volume of press-juice obtained per 100 gm. of hardened leaves was inversely proportional to the hardiness of a variety. This volume is largely determined by 2 hardiness factors, the dry matter content and imbibition pressure of the leaves. When unhardened leaves were used, no relation could be found between imbibition pressure or volume of press-juice and hardiness. The imbibition pressure of hardened leaves appears to depend on the physical state of the cell colloids characteristic of living tissues, since this property was lost when the tissues were killed. The moisture content of hardened tissues tends to be inversely porportional to hardiness. There is some evidence that in hardy varieties it fluctuates less with changes in weather conditions, and a possible explanation of this as a colloidal property is suggested. The quantity of hydrophilic colloids contained in the press-juice of hardened tissues, as measured by an effect on the activity of water, was found to be directly proportional to hardiness. A method, based on the composition of the fresh tissue and its press-juice, is proposed for the quantitative study of plant cell colloids. Preliminary results by this method indicate a wide variation in the distribution of nitrogen between cell colloids and aplastic forms. It appears probable that during the hardening process hardy varieties accumulate more protein in the form of cell colloids. The possible utility of the "gold number," as a measure of the quality of cell colloids, is pointed out. The ratio of amino N to total N increased in all varieties in late fall, indicating an association of protein-splitting with the later stages of the hardening process. Some correlation was found between the sugar content of hardened leaves and hardiness. The value of sugar as a protection against the precipitation of proteins by freezing, was demonstrated by the use of press-juice from greenhouse leaves. Precipitation was largely inhibited by the addition of 8% of dextrose, completely so by 8% of sucrose. The rate of sugar loss from the leaves in late fall was found somewhat greater in non-hardy varieties. A more profound dormancy in the hardy varieties with a slower rate of respiration, is suggested as a possible explanation.—*Author.*

9549. Staker, Ernest V. **The effect of dry heat on alfalfa seed and its adulterants.** Jour. Amer. Soc. Agron. **17**: 32–40. 1925.—Heating commercial alfalfa seed between the temperatures of 60 and 90°C. increased the germination. The increase in germination of heated over unheated seed is due to the reduction of the number of hard seed. Light green or colored alfalfa seed is more responsive to heating than is brown colored seed. A large proportion of the inferior seed of alfalfa probably can be killed when dry—heated at 85–90°C. Russian thistle and white tumbleweed seed seem to be completely killed in 4 hours at temperatures of 85 and 90°C. Seed of sour dock and buckhorn plantain were seriously affected. It is believed that dodder can be successfully controlled by heating alfalfa containing the seed at a temperature of 80–90° for 4 hours.—*G. M. Schertz.*

RADIANT ENERGY RELATIONS

9550. Hill, L., and A. Eidenow. **The biological action of light. I. The influence of temperature.** Proc. Roy. Soc. London B 95: 163–180. *Pl. 11, fig. 3.* 1923.—In connection with a study of the action of light of short wave lengths on human skin and other animal tissues, experiments were performed on hay infusoria and typhoid bacilli. In general the lethal effect varied with temperature and distance from source of light, little effect being noted in cool cultures. If too cold (below 0.5°C.), however, resistance of the organisms was lowered. The temperature coefficient between 10° and 20° is nearly 3, suggesting a chemical effect at this range. The following equation was derived: $\frac{T\sqrt{t}}{D} = K = 4.5$, where T = temperature in °C., t = lethal time in minutes, and D = distance in inches.—*P. B. Sears.*

9551. Nadson, G. A. **Über die Primärwirkung der Radiumstrahlen auf die lebendige Substanz. [The primary action of radium emanations on the living substance.]** Biochem. Zeitschr. **155**: 381–386. *1 fig.* 1925.—The action of radium emanations was observed on yeast cells. The primary effect is considered to be ionization, whereby the protein-lipoid complex disintegrates and the lipoid appears as drops in the protoplasm. At the same time the protein is denatured and becomes aggregated. This is accompanied by decreased "permeability," increased "osmotic pressure" and turgor, enlargement of the vacuole and of the cell. Further exposure coagulates the protein, increases "permeability," decreases turgor, the vacuole disappears and the cell collapses. During the 1st stage the cell is living and the changes reversible; during the 2nd the changes are irrreversible and the cell dies. The action of Roentgen rays is the same as that of radium emanations.—*H. D. Hooker.*

9552. Pincussen, L. **Fermente und Licht. VI. Über Beeinflussung von Fermentwirkung durch Jodsalze unter Bestrahlung. [Enzymes and light. The influence of iodides on enzyme activity under irradiation.]** Biochem. Zeitschr. **152**: 406–415. 1924.—Pancreatic diastase, saliva and Taka-diastase were protected by KI from the injury produced by exposure to a mercury-quartz lamp. Malt diastase was not protected.—*H. D. Hooker.*

TOXIC AGENTS, STIMULATION

9553. Collison, R. C. **The presence of certain organic compounds in plants and their relation to the growth of other plants.** Jour. Amer. Soc. Agron. **17**: 58–68. 1925.—The author concludes that the type of injury which results from straw might be caused by one or more of the following: tyrosine, dihydroxy-stearic acid, vanillin, or cumarin.—*F. M. Schertz.*

9554. Feher, D., und I. Vági. **Untersuchungen über die Einwirkung von Nitriten auf das Wachstum der Pflanzen. [The effect of nitrites on plant growth.]** Biochem. Zeitschr. **153**: 156–158. 1924.—Wheat grew in soil containing 1 gm. of $NaNO_2$ per kgm., for 4 weeks without signs of toxicity.—*H. D. Hooker.*

9555. Hawkins, R. S. **Hydrocyanic acid as a toxic agent to plant growth.** Jour. Amer. Soc. Agron. **17**: 169–171. 1925.—If present in the soil solution in a concentration of 1 part per million or more, HCN would quite likely depress growth in most plants.—*F. M. Schertz.*

9556. Keeser, E. **Zur Kenntnis der Wirkungen undissoziierter Arzneimittel. [The action of undissociated drugs.]** Biochem. Zeitschr. **150**: 514–521. 1924.—The toxic action of phenol and of phenyl sulphonic acid toward *Staphylococcus pyogenes aureus* increased with increase in H-ion concentration. The effect is attributed to reduced dissociation.—*H. D. Hooker.*

9557. Knott, James E. **Effect of soaking seed of some vegetables before sowing.** Jour. Amer. Soc. Agron. **17**: 49–54. 1925.—Soaking seed of beets, cabbage and tomato in shallow distilled water for 24 hours shows no definite influence on the later growth and yield, if the plants from the soaked and dry seed appear above the ground at the same time. The stimulating advantage claimed for soaking may be due simply to the initial headstart of the soaked seed at a time when the plant is at its greatest efficiency. Soaking for 24 hours affected the length of the germination period differently with the various crops.—*F. M. Schertz.*

9558. Lesage, Pierre. **Sur la toxicité de l'eau distillée en alambic métallique et sa neutralisation. [The toxicity of water distilled in a metal still and its neutralization.]** Rev.

Gén. Bot. 36: 145–158. 1924.—Dwarf peas were used to test the toxicity. Water from a metallic still is shown to be as harmful as is often expected from previous knowledge. Dissolving salts in this water was not always sufficient to neutralize its harmfulness. Sylvinite below 0.01 mol. did not accomplish this neutralization. NaCl and KCl alone or mixed in the proportions in which they occur in sylvinite ($\frac{2}{3}$ NaCl + $\frac{1}{2}$ KCl) did not accomplish this neutralization in concentrations between 0.01 and 0.08 mol. The mixture of these 2 salts ($\frac{2}{3}$ NaCl + $\frac{1}{2}$ KCl) if modified by the addition of $CaSO_4$ and $MgCl_2$ in the proportions in which they occur in sylvinite, neutralized the toxicity of the water from the metal still at about the same concentrations as did sylvinite itself. The anti-toxic role seemed to be played by the $MgCl_2$. —*J. C. Gilman.*

9559. Levine, Victor E. **The effect of selenium compounds upon growth and germination in plants.** Amer. Jour. Bot. 12: 82–90. 1925.—Selenious acid, selenic acid, sodium selenite, sodium selenate and potassium selenocyanid, when in concentrations of 0.01 % or more are exceedingly inimical both to the growth and to the germination of lupin and timothy seed, with their relative toxicity in the order given. Increased growth has been observed with very dilute solutions (0.0001%, 0.001%) of selenious acid and of selenic acid.—*E. W. Sinnott.*

9560. Lundegardh, H. **Über die Interferenzwirkung von Wasserstoffionen und Neutralsalzionen auf Keimung und Wachstum des Weizens. [The antagonism of hydrogen ions and ions of neutral salts shown in germination and growth of wheat.]** Biochem. Zeitschr. **149**: 207–215. *5 fig.* 1924.—The germination of wheat and its growth determined by fresh and dry weights were measured after 10 to 14 days in soils containing known amounts of KCl, sodium phosphate or $CaCl_2$ at various H-ion concentrations. The curves, usually showing 2 maxima, are interpreted on the basis of a composite effect of H-, Al- and Fe-ions. The different effect of the various salts are thought to be based on antagonism between H-ions and the ions of the salts.—*H. D. Hooker.*

9561. Popoff, Methodi. **Düngung, Düngmittel, und Zellstimulatien. [Manuring, manures and cell stimulation.]** Zellstimulations Forsch. **1**: 117–128. 1924.—As the result of pot and plot experiments the author concludes that artificial manures serve not only in the nutrition of plants but also under favorable climatic conditions stimulate the seed. This stimulation may in especially favorable cases result in a considerable increase in the nutritional effect of the manure.—*Author (translated).*

9562. Popoff, Methodi. **Experimentelle Zellstudien V. Biologische Möglichkeiten zur Hebung des Ernteertrages. [Experimental cell studies V. Biological possibilities of increasing yield.]** Biol. Centralbl. **43**: 244–268. 1923.—Solutions of $MgCl_2$, $MgCl_2 + MgSO_4$, $MgSO_4 + MnSo_4$, $MgCl_2 + Mn(NO_3)_2$, ether, sodium arsenate, potassium arsenate, strychnine nitrate, formic acid, potassium permanganate, H_2O_2, injected under the resting buds of *Syringa vulgaris* caused early development. Treatment of the seed of millet, corn, rice, onion, wheat, etc., with cell-stimulating solutions produced larger, sturdier plants with strongly developed root systems and increased the yield 25–30%. The concentration and duration of treatment must be strictly controlled for favorable results.—*Author (translated).*

9563. Popoff, Methodi. **Ueber Zellstimulantien und ihre theoretische Begrundung. [Cell stimulation and its theoretical foundation.]** Jahrbuch, Univ. Sofia 19^2: 51–85. 1922–1923.—See also **Zellstimulantien und ihre theoretische Begrundung.** Zellstimulations Forsch. **1**: 3–38. 1924, and **Des stimulants cellulaires et le fondement theoretique de leur action.** Jour. Physiol. et Path. gén. **1923**: 482–492. 1923.—All chemical agents which stimulate the cell increase the oxidation processes of the living molecules of the cell and as a result the growth of the cell. A considerable number of experiments with rice are quoted to support this theory. Treatment of the seed with simulating materials resulted in stronger growth and increased yield.—*Author (translated).*

9564. Popoff, Methodi. **Zellstimulantien und ihre theoretische Begrundung. II Teil. Physikalische Stimulantien. [Cell stimulation and its theoretical foundation. Part 2. Physical stimulants.]** Zellstimulations Forsch. **1**: 257–264. 1924.—An attempt is made to explain the stimulation by mechanical means, light, electricity, Röntgen rays, radium emanation, temperature, and high and low pressure by Popoff's theory of the deoxidizing action of cell stimulants. Experiments are discussed which oppose this method of explanation.

This conception leads to important conclusions regarding the application of many physical methods of therapeutic procedure and the limits of their optimal use.—*Author* (*translated*).

9565. Popoff, Methodi, und M. Jeliaskowa. **Ueber die Beschleunigung der Teilungsrate von Paramaecium caudatum durch Zellstimulierende Mittel. [Increase of division rate of Paramoecium caudatum by cell stimulation.]** Biol. Centralbl. 44: 87–90. 1924.—By treating Paramoecia a few minutes with $Mn(NO_3)_2$, potassium arsenate, KI, or methyl alcohol the division rate is greatly increased. Using a single initial individual the control showed 883 and treated with $Mn(NO_3)_2$ 2490; the control 218 and treated with KI 6550.—*M. Popoff* (*translated*).

9566. Silbert, Dorothy. **Notes on the stimulating influence of seed treatment upon the subsequent growth of the plants.** New Jersey Agric. Exp. Sta. Ann. Rept. 44: 259–262. 1923. [1924].—Soybean seed of uniform weight, Canada field peas and buckwheat were treated for 15 minutes in various concentrations of $CuSO_4$, sodium hypochlorite, $HgCl_2$ and formalin. Check seed were treated for a like period of time in distilled water. With the exception of the seed treated in $HgCl_2$ at concentration of 0.05 and 0.15 %, all lots of treated soybean seed showed a yield increase. The increase in average yields from the seed treated with $CuSO_4$ amounted to more than 20% with each concentration of the salt. The increase from the remaining 2 salts was less marked. The average yield of tops from treated seed of buckwheat was not much higher than from the untreated but there was a pronounced increase in yield of seed in the case of each of the salts used. While seed treatment apparently had little influence on germination, the plants from the treated seed appeared to mature somewhat earlier than those from the untreated.—*Wm. H. Martin.*

ELECTRICITY

9567. Blackman, V. H., A. T. Legg, and F. G. Gregory. **The effect of a direct current of very low intensity on the rate of growth of the coleoptile of barley.** Proc. Roy. Soc. London B 95: 214–228. *Fig. 1–6.* 1923.—The rate of growth of the sheathed stem of barley seedlings is increased by exposure for 1–3 hours to a positive point discharge of high voltage and low intensity. When the current is stopped there ensues a vigorous after-effect, the rate of growth increasing for at least 4 hours, becoming greater at length than the direct effect. This after-effect is less after an exposure of 3 hours than of 1 hour. If the point be negatively charged there is an acceleration of growth during the 1st hour but by the 3rd the rate is little above normal. The after-effect then occurs but is less than with the point positively charged. It is unlikely that gaseous products of discharge, or "electric wind" play a part in the growth stimulation observed.—*P. B. Sears.*

PHYSIOLOGY OF DISEASE

9568. VanDine, D. L. **The effect of leaf-hopper injury on the sugar-content of grapes.** Jour. Econ. Entomol. 16: 353–357. 1923.—The grape leafhopper, *Erythroneura comes* Say, is a major pest in the vineyards of the Pennsylvania grape belt along Lake Erie. During seasons of high leaf-hopper infestation, the grapes do not ripen properly. The effect of a nicotine spray on the leaf-hopper, under the high leaf-hopper infestation found during the season of 1922, was determined by a comparison of the sugar-content of grapes (as indicated by the Brix spindle) that received the nicotine spray with grapes that were not sprayed. In a season of severe leaf-hopper infestation, a nicotine spray applied to the vines during the period when the maximum number of nymphs of the 1st generation of leaf-hoppers are present, will permit the production of grapes of table quality. The sugar-content of the grape juice, under conditions of high leaf-hopper infestation, is an index of the efficiency of the control measure. —*Author.*

MISCELLANEOUS

9569. Morgan, G. J., and J. H. Quastel. **The reduction of methylene blue by iron compounds.** Proc. Roy. Soc. London B 95: 61–71. 1923.

TAXONOMY OF VASCULAR PLANTS

J. M. Greenman, *Editor*

E. B. Payson, *Assistant Editor*

(See also in this issue Entries 8265, 8414, 8427, 8630, 8680, 8717, 8722, 8725, 8883, 8917, 9074, 9628)

GENERAL

9570. Anonymous. [Rev. of: Fitch, W. H., W. G. Smith and others. **Illustrations of the British Flora: a series of wood engravings with dissections of British plants.** *5th ed. rev. xxvii + 338 p.* L. Reeve & Co.: London, 1924.] Nature **115**: 415. 1925.

9571. Anonymous. [Rev. of: Setchell, W. A. **American Samoa; Pt. 1. Vegetation of Tutila Island; Pt. 2. Vegetation of the Samoas** (see Bot. Absts. 14, Entry 4128); **Pt. 3. Vegetation of Rose atoll.** *vi + 275 p. 37 pl.* Dept. Marine Biol. Carnegie Institution Washington. Vol **20**. Carnegie Institution: Washington, 1924.] Nature **115**: 600-601. 1925.

9572. Font y Quer, Pio. **Los herbarios de Cataluña y su conservation. [The herbariums of Catalonia and their preservation.]** Mem. R. Acad. Cien. y Artes [Barcelona] III. **18**^{18}: 431-442. 1925.—This is an address on the value of herbariums and the care they have received in some of the provinces of Spain.—*L. L. Harter.*

9573. Hyata, Bunzo. **An interpretation of Goethe's Blatt in his "Metamorphose der Pflanzen," as an explanation of the principle of natural classification.** Icones Plantarum Formosanarum **10**: 75-95. *Fig. 1.* 1921.—The author attempts to interpret Goethe's theory of the leaf and bring it into harmony with his own theory of the dynamic system of classification. For a statement of this dynamic system see Bot. Absts. 10, Entry 1392).—*E. B Payson.*

9574. Herrmann. [Rev. of: Hegi, Gustav. **Illustrierte Flora von Mittel-Europa. 5 Bd., I Teil, Lieferungen 70-72. (Illustrated flora of Central Europe.)** J. E. Lehmann: Munich, 1925.] Deutsch. Forstzeitg. **40**: 551-552. 1925.—These sections cover the Rhamnaceae, Vitaceae, Tiliaceae, and part of the Malvaceae. The reviewer calls attention to an error in the description of *Tilia platyphyllos* Scop. (*T. grandifolia* Ehrh.). The under side of the leaves is never bluish green, as stated, but always bright green.—*W. N. Sparhawk.*

9575. Hitchcock, A. S. **Methods of descriptive systematic botany.** *vii + 216 p.* John Wiley & Sons: New York and London, 1925.—"The preparation of this work was suggested by the inability of the author to refer beginners in systematic botany to literature treating of descriptive taxonomy from the standpoint of technique. . . . . During the past thirty or forty years, taxonomic botany has developed working methods differing from those of most early systematists in the greater amount of field work done and in the greater precision in nomenclature . . . . the author has set down what some twenty-five years of taxonomic work has taught him of the art and science of his craft. The first six chapters deal with the elements of descriptive taxonomy; the remainder of the work treats of the subject from the standpoint of advanced students or those beginning their professional careers as assistants in botanical institutions." After an introductory chapter the following main subjects are considered: Categories in the natural system; nomenclature; authors of taxonomic groups; the use of manuals and floras; the identification of plants; the preparation of a local flora; field, herbarium, and library; the preparation of a flora or manual; the preparation of a revision of a taxonomic group: keys and synopses; publication of groups; homonyms and synonyms; types; codes of nomenclature; the grass herbarium; traveling in Tropical America; and miscellaneous notes, including editorial hints, illustrations, indexing, choice of names for genera and species, the author's duty in coördinating publication and herbarium, and location of some type specimens of American grasses. An appendix takes up rules for bibliographic abbreviations, and the type-basis code.—*Frederick V. Rand.*

9576. Parker, R. N. **A forest flora for the Punjab with Hazara and Delhi.** *2nd ed. Roy. 8vo. xxxv + 591 p.* Superintendent, Government Printing: Punjab, 1924.—In addition to the native forest flora, the author has recorded most of the exotic trees and shrubs grown in the Punjab. The exotics are described in small type which readily differentiates them from the indigenous species. A general account of the flora of the Punjab, descriptive of the 4 vegetative areas outlined, namely, the plains, the salt ranges, the sub-Himalayan tract, and the Himalaya, precedes the main portion of the work. Keys are provided, ample descriptions are given, and copious notes are added.—*J. M. Greenman.*

9577. Parkin, John. **The phylogenetic classification of flowering plants.** Nature **115:** 340–342, 385–387. 1925.—Reference is made to the papers of J. Hutchinson in the Kew Bulletin, also to other works. He agrees with the plan of regarding the Ranalean families as a base, interpolating the apetalous families among the polypetalous and deriving the monocotyledons from early dicotyledons. The significance of Treub's study on *Casuarina* and of Wieland's on the Bennettiales is discussed. The attention given to the relation and origin of herbaceous and woody forms is regarded as a productive field of study.—*O. A. Stevens.*

9578. Ridley, Henry N. **The flora of the Malay Peninsula. Vol. IV. Monocotyledones.** *8vo, 383 p. Fig. 160–209.* L. Reeve & Co., Ltd.: London, 1924.—The present volume embraces the families Hydrocharitaceae to the Flagellariaceae inclusive, arranged in the sequence of Bentham and Hooker's General Plantarum. The following new species, varieties, names, and combinations are included: *Liparis purpureo-viridis* Burkill, *Sarcopodium citrino-castaneum* (*Dendrobium citrino-castaneum* Burkill), *Desmotrichum Kelsali* (*Dendrobium Kelsali* Ridl.), *D. Ardeni* (*D. Ardeni* Ridl.), *D. roseo-punctatum* (*D. roseo-punctatum* Ridl.), *D. pallidiflorum* (*D. pallidiflorum* Ridl.), *D. lepidum* (*D. hymenopterum* Ridl., not Hooker), *D. exilicaule* (*D. tenuicaule* Ridl., not Hooker), *D. sanguinolentum* Lindl. var. *cerinum* (*D. cerinum* Rchb. f.), *D. Haniffi*, *Bulbophyllum variabile* Ridl. var. *rubrum*, *B. minutulum*, *B. oreas*, *B. oeneum* Burkill, *B. nematocaulon*, *B. longistelidium*, *B. xanthum*, *B. rhizophoreti* (*B. Curtisii* Ridl.), *B. punctatissimum*, *B. Annandalei*, *B. pulchellum* Ridl. vars. *purpureum* and *brachysepalum*, *Eria larutensis*, *E. linearifolia*, *Trichotosia poculata* Kranzl. var. *ophirensis*, *T. tuberosa* (*Eria tuberosa* Hook. f.), *Ceratostylis linearifolia*, *Spathoglottis plicata* Bl. var. *alba*, *Calanthe angustifolia* Lindl. var. *flava*, *Preptanthe rubens* (*Calanthe rubens* Ridl.), *Limotodis pallidus* (*Phaius pallidus* Ridl.), *Coelogyne tomentosa* Lindl. vars. *Massangeana* (*C. Massangeana* Rchb. f.) and *cymbidioides* (*C. cymbidioides* Ridl.), *C. stenophylla* (*C. angustifolia* Ridl., not Parish or Wight), *Crinonia Elizabethiana* (*Pholidota Elizabethiana* Ridl.), *C. parviflora* Pfitzer var. *pumila*, *Chelonistele perakensis* (*Coelogyne sulphurea* Hook. f., not Rchb. f.), *C. pusilla* (*Coelogyne pusilla* Ridl.), *Cymbidium rectum*, *Saccolabium adnatum* (*Sarcochilus adnatus* Ridl.), *Taeniophyllum macrorrhizum* (*T. gracillimum* Ridl., not Schlecter), *T. culiciferum*, *Sarcochilus tahanensis* (*S. crassifolius* Ridl., not Rolfe), *Ascochilus capricornis*, *Thrixspermum iodochilus*, *Dendrochila brachyglottis* (*Sarcochilus brachyglottis* Hook. f.), *Appendicula densifolia* (*Podochilus densifolius* Ridl.), *A. robusta*, *Aplostellis flabelliformis* (*Pogonia flabelliformis* Lindl.), *A. velutina* (*P. velutina* Par. & Rchb. f.), *A. punctata* (*P. punctata* Bl.), *Leucolena ornata* Ridl. var. *singapurensis*, *Cystorchis variegata* Bl. var. *purpurea*, *Haemaria discolor* Lindl. vars. *Ordiana* Williams and *Dawsoniana* (*H. Dawsoniana* Bot. Mag. *t. 7486*), *Goodyera gracilis* Hook. f. var. *unicallosa*, *Habenaria carnea* N. E. Brown var. *minor*, *Paphiopedilum Robinsonii* (*Cypripedium Robinsonii* Ridl.), *Hedychium malayanum*, *Kaempferia cyanescens* (*Elettariopsis cyanescens* Ridl.), *Gastrochilus flava* (*G. monor* Ridl., not Baker), *G. subbilobus* Burkill, *G. longifolia*, **Hitcheniopsis** n. gen. of Zingiberaceae, *H. Kunstleri* (*Curcuma Kunstleri* Bak.), *H. lanceolata* (*C. lanceolata* Ridl.), *H. sylvestris* (*C. sylvestris* Ridl.), *Zingiber gracile* Jack var. *elatior*, *Z. Griffithii* Bak. var. *major*, *Amomum aurantiacum*, *A. xanthoglossum*, *A. spiceum*, *A. cephalotes*, *A. Holttumii*, *Phaeomeria imperialis* Lindl. var. *speciosa*, *Geostachys densiflora*, *G. primulina*, *Alpinia Seimundii*, *A. aurantiaca* Ridl. var. *hirtior*, *A. pahangensis*, *A. javanica* Bl. var. *colorata*, *A. campanaria*, *Stachyphrynium parvum* (*S. minus* Ridl., not Schumann), *Phrynium basiflorum* Ridl. var. *nobile*, *P. tristachyum*, *Orchidantha longiflora* (*Lowia longiflora* Scort.), *O. maxillariodes* (*L. maxillarioides* Hook. f.), *Trichopus malayanus* (*T. zeylanicus* Hook. f., not Gaertner), *Dioscorea Porteri* Prain & Burkill with vars. *purpureo-venia* and *Andersoni* Prain & Burkill, *D. piscatorum* Prain & Burkill, *Peliosanthes monticola*, *Dracaena cuspidata*, *D. umbratica* (*D. terniflora* Ridl., not Roxb.), *D. elliptica* Thunb. vars. *gracilis* (*D. gracilis* Wall.) and *montana*, and *Aneilema subovatum.*—*J. M. Greenman.*

9579. Ridley, Henry N. The flora of the Malay Peninsula. Vol. V. Monocotyledones (concluded), Gymnospermae, General Indices. *8vo, 470 p. Fig. 210–229.* L. Reeve & Co., Ltd.: London, 1925.—The present volume includes the families Palmaceae to Cycadaceae, a supplement of considerable length, an index to English plant-names, a list of illustrations, and a general index to the entire work. New genera, species, names, varieties, and combinations published herein are the following: *Areca latiloba, Pinanga glaucescens, P. fruticans, Iguanura geonomaeformis* Mart. var. *typica* subvar. *ramosa* and var. *malaccensis* (*I. malaccensis* Becc.), *Caryota aequatorialis* (*C. obtusa* Griff. var. *aequatorialis* Becc.), *Liculala glabra* Griff. var. *selangorensis* Becc., *Daemonorops setigerus* (*D. periacanthus* Ridl., not Miq.), *Calamus javensis* Bl. vars. *purpurascens* and *inermis, C. Burkillianus* Becc., *C. distans, C. pauciflorus, Plectocomiopsis ferox, Pandanus pentodon, P. irregularis, P. muarensis* (*P. johorensis* Ridl., not Martelli), *P. collinus* Ridl. var. *spinulosus, P. odorus, Homalomena coerulescens* Jungh. var. *pontederiaefolia* (*H. pontederiaefolia* Griff.), *humilis* Hook. f. var. *undulata, H. repens, H. Griffithii* Hook. f. var. *ovata* (*H. ovata* Hook. f.), *H. angustifolia* Hook. f. var. *parvula, Schismatoglottis calyptrata* Zoll. & Mor. var. *ornata, Piptospatha Ridleyi* Hook. f. var. *lanceolata, P. perakensis* (*Schismatoglottis elongata* Hook. f., not Engler), *Anadendrum montanum* Schott var. *cordatum, Raphidophora Burkilliana, Pothos salicifolius, Eriocaulon glabriflorum, E. disepalum, Fimbristylis trichophylla, F. ferruginea* Vahl var. *arvensis* (*F. arvensis* Vahl), *Actinoschoenus filiformis* Benth. var. *rupestris, Lepidosperma chinense* Nees & Meyen var. *alpina, Hypolytrum radians* (*Mapania radians* Clarke), *Scleria gonocarpa* (*S. trigonocarpa* Ridl., not Boeckeler), *Carex breviglumis, Dimeria glabra, Sclerostachyum Ridleyi* Stapf (*Saccharum Ridleyi* Hack.), *Sorghum affine* Stapf (*Andropogon affinis* Presl), *Eulalia Milsumi, E. Ridleyi* Stapf (*Pollinia Ridleyi* Hack.), *E. praemorsa* Stapf (*Polytrias praemorsa* Hack.), *Ischaemum imbricatum* Stapf (*I. aristatum* var. *imbricatum* Hack.), *I. plumulosum* Stapf, *I. maculatum* Stapf, *I. commelynifolium* Stapf, *I. fluviatile, I. macrurum* Stapf, *I. apricum, Coelorrachis glandulosa* Stapf (*Rottboellia glandulosa* Trin.), *Mnesithea cancellata* (*Rottboellia cancellata* Ridl.), *Chrysopogon collinus, Dichanthium caricosum* Stapf (*Andropogon caricosus* L.), *Cymbopogon nardus* (*Andropogan Nardus* L.), *C. citratus* Stapf (*A. citratus* DC.), *Themeda subsericans* (Hack.), *Digitaria caespitosa, D. pusilla, Paspalum platycoleum, Paspalidium punctatum* Stapf (*Panicum punctatum* Burm.), *Brachiaria distachya* Stapf (*Panicum distachyum* L.), *Hemigymnia fusca, Acroceras sparsum* Stapf (*Panicum oryzoides* Ridl., not Sw.), *A. Ridleyi* Stapf (*P. Ridleyi* Hack.), *Sacciolepis turgida* and var. *repens, S. myosuroides* (*Panicum myosuroides* Br.), *Cyrtococcum oxyphyllum* Stapf, *C. carinatum* Stapf, *C. accrescens* Stapf (*P. accrescens* Trin.), *Isachne semitalis* (*I. Kunthiana* Ridl., not Wight), *I. saxicola* (*I. javana* var. *saxicola* Ridl.) and var. *denticulata, Triraphis madagascariensis* Stapf (*Neyraudia madagascariensis* Hook. f.), *Bambusa pauciflora, B. Klossii, Gigantochloa latifolia, Dendrocalamus hirtellus, Schizostachyum subcordatum, S. grande, S. elegans, Gnetum campestre* Gamble (*G. microcarpum* var. *campestre* Ridl.), *G. sylvestre* Gample (*G. microcarpum* var. *sylvestre* Ridl.), *Podocarpus deflexus, Talauma oblanceolata, Goniothalamus pendulifolius, Kayea daphnifolia, K. Kunstleri* King var. *rosea, Pentaphylax arborea, Grewia polygama* Roxb. var. *Curtisii, Atalantia polyandra, Stemonurus corniculatus* (*Platea corniculata* Becc.), *Euonymus coriaceus, E. pahangensis, E. micropetalus, Hippocratea obtusa, Ventilago Kurzii* (*Apteron lauceolatum* Kurz), **Phoenicimon** n. gen. of the Sapindaceae, *P. rubiginosus, Semecarpus glabra, Fordia ophirensis, F. lanceolata,* **Burkillia** n. gen. of the Leguminosae, *B. alba, Bauhinia praesignis, B. breviflora, Pygeum velutinosum, Weinmannia Blumei Planch.* var. *major, Eugenia orites, E. nitidula, E. johorensis, E. goniocalyx, Marumia rufolanata, Memecylon lancifolium, Begonia Foxworthyi* Burkill, *Alangium rotundatum, Argostemma bifolium, A. acuminatissium, A. longistipula, Xanthophytum biceps, Tarenna lancifolia, Maba racemosa, Diospyros Hendersoni, Micrechites tubulosa, Fagraea flavidula, Cyrtophyllum speciosum* (*Fagraea speciosa* Bl.) and var. *montanum,* **Micraeschynanthus** n. gen. of the Gesneraceae, *M. dischidioides, Paraboea salicina* var. *major, Strobilanthes ruficapillis, Piper venosum, P. subgrande, Dehaasia elliptica, Litsea terminalis, Loranthus validus, Scortechinia paniculata, Croton macrocarpa, Globba flavidula, Amomum rivale, Alpinia mollissima,* and *Madhuca chrysocarpa* (*Ganua chrysocarpa* Dubard).—*J. M. Greenman.*

PTERIDOPHYTES

9580. Marie-Victorin, Frère. **Les Filicinées du Québec. [The Filicineae of the Province of Quebec.]** Contrib. Lab. Bot. Univ. Montréal 2: 1–98. 1923.—This is a monograph of the ferns of the Province of Quebec, Canada. Under the head Filicineae the author includes the true ferns with spore-cases originating from a single epidermal cell, and the grape-ferns with spore-cases originating from a group of epidermal cells. The introduction deals with the physiography of the territory, the distribution and ecology of the species. As regards distribution, the division includes: (1) Species whose ranges outlie North America, and (2) species with strictly North American range. The first group is divided into: (a) Cosmopolitan species, (b) circumboreal species, and (c) species common to Eastern Asia and Eastern America. The 2nd group splits into: (d) Species closely allied to a corresponding Eurasian phase, and (e) strict endemics. The latter are mostly confined to and general in the vast tract of country stretching between the Cordillera and the Atlantic Ocean, but a numerically small though theoretically important florula is made of Cordilleran species found erratically in Eastern Quebec, mostly with an intervening blank area of 2000 miles. Ecologically, the usual division into xerophytes, mesophytes and hydrophytes is used, each group comprising oxylophilous, calciphilous and indifferent types. The body of the work consists in the systematic treatment of the 62 species accepted. The nomenclature is brought up to date. The species and varieties are fully described. No new types are proposed, but several new hybrid combinations are made. Great emphasis is laid on local distribution, and the treatise is supplemented with copious notes on the history, uses and folklore of the plants. The author, though with avowed sympathy for absolute priority, adopts the International Rules of Nomenclature. He rejects the term "spore" as lacking precise meaning, and uses instead the term "diode" (from the Greek *diodos*, a passage), introduced by Van Tieghem to designate the cell bridging the gap between the asexual and the sexual phases of the individual.—*Author.*

9581. Marie-Victorin, Frère. **Les Lycopodinées de Québec. [The Lycopodineae of the Province of Quebec.]** Contrib. Lab. Bot. Univ. Montréal 3: 1–121. *1 pl., 11 fig.* 1925.—This is a monograph of the Class Lycopodineae, as represented in the Province of Quebec, Canada. The first part is devoted to the discussion of the taxonomy, phylogeny, ecology and distribution of the species. In each case an effort is made to gain a clear concept of types. It is argued for instance that the Linnaean type of *Lycopodium clavatum* is a 2-spiked phase with secondary peduncles almost lacking. On this basis the main varieties and forms already described are rearranged and several new ones proposed. Particular emphasis is laid on the *L. complanatum* (Section Complanata) group, so full of intricacies both in Europe and America. It is contended that much of the ambiguity of the group is due to hybridization within a limited number of good species. The waters running through the upper layers of the soil are likely to scatter the swarms of antherozoids escaping from the hypogean gametophytes and to drive them towards prothallia of different species. The Linnaean type of *L. complanatum* is also defined as a 2-spiked phase. The common Quebec representative of this species, a 1-spiked phase, is given a varietal name, and several other American phases as well. The Alleghenian representative of the group, *L. flabelliforme* (Fernald) Blanchard, is restored to specific rank. Its geographical distribution is compared with that of *L. complanatum,* and the critical forms are explained by hybridization. A comprehensive diagram is given, outlining the hypothetical phylogeny of Section Complanata, on the assumption that the trend of evolution has been from an axially symmetrical type (probably *L. sabinaefolium* var. *sitchense*) to an extreme development of bilateral symmetry (tropical and Asiatic varieties of *L. complanatum*). *L. tristachyum* is fully discussed and considered as linking *L. sabinaefolium* and *L. complanatum. L. flabelliforme* is supposed to be a newly-arisen branch in the phylum. The 2nd part of the work is a regular systematic arrangement with full descriptions of the 3 families included: Lycopodiaceae, Isoetaceae and Selaginellaceae. Copious notes on distribution, ecology and folklore are added. The following new varieties, forms and combinations are described of which Marie-Victorin is the author unless otherwise indicated: *L. clavatum* L. var. *laurentianum, L. clavatum* L. var. *subremotum, L. clavatum* L. var. *megastachyon* Fern. & Bissell forma *furcatum* (Luerss.), *L.*

clavatum L. var. *laurentianum* forma *furcatum* (Luerss.), *L. clavatum* L. var. subremotum forma *frondosum*, *L. clavatum* L. var. *subremotum* forma *furcatum* (Luerss.), *L. clavatum* L. var. *subremotum* forma *frondescens* (Luerss.), *L. obscurum* L. var. *dendroideum* (Michx.) D. C. Eaton forma *proliferum*, *L. obscurum* L. var. *dendroideum* (Michx.) D. C. Eaton forma *exsertum*, *L. obscurum* L. var. *dendroideum* (Michx.) D. C. Eaton forma *exsertum-furcatum*, *L. obscurum* L. var. *dendroideum* (Michx.) D. C. Eaton forma *monostachyon*, *L. sabinaefolium* Willd. var. *patens*, *L. sabinaefolium* Willd. var. *superfertile*, *L. tristachyum* Pursh var. *laurentianum*, *L. tristachyum* Pursh var. *Habereri* (House), *L. flabelliforme* (Fern.) Blanchard var. *ambiguum*, *L. flabelliforme* (Fern.) Blanchard forma *proliferum*, *L. complanatum* L. var. *canadense*, *L. complanatum* L. var. *elongatum*, *L. complanatum* L. var. *elongatum* forma *simplex*.—*Author.*

9582. Sim, T. R. **Notes on South African ferns and Rhodesian mosses.** South African Jour. Sci. **20**: 309–315. *Pl. 9.* 1923.—A new fern, *Hymenophyllum Henkelii* Sim, is described from the forests of Southern Rhodesia and a number of new localities are mentioned for South African ferns which have been previously recorded.—*E. M. Doidge.*

9583. Weber, Ulrich. **Zur Anatomie und Systematik der Gattung Isoëtes. [Anatomy and taxonomy of the genus Isoëtes.]** Hedwigia 63: 219–262. *45 fig.* 1922.—The author confined his anatomical studies mainly to *Isoëtes lacustris* L. and his taxonomic studies to the species of South America; but the anatomic studies of other writers are summarized and discussed. Weber found that, in the species studied by him, primary phloem is absent from the stem; that pitted walls occur in parenchyma cells and are not confined to phloem as some workers have supposed; that cambium produces parenchyma on the outside and this tissue and trachieds inside; that cell walls of bulbs, tubers, leaves and roots are composed mainly of pectin; and that the ligule perhaps functions for the passage of moisture. Weber's studies have increased the number of the South American species from 8 to 20. *Isoëtes gigantea*, *I. boliviensis*, *I. peruviana*, *I. Goebelii*, *I. Herzogii*, *I. Hieronymi*, *I. Ekmani*, *I. laevis*, *I. triangula*, *I. montana*, and *I. Ulei* are new species described by Weber. *Isoëtes Weberi* is described by Herter.—*Bruce Fink.*

SPERMATOPHYTES

9584. Altona, T. **Casuarina Equisetifolia Forst. (Tjemara). (With English summary.)** Tectona **18**: 243–276. 1925.—A botanical investigation of *Casuarina equisetifolia* Forst. and *C. montana* Miq. showed that there are so many intermediary forms between these 2 species that at least the distinctions adopted by Miquel are of no value, and as long as no other constant distinctions can be ascertained, the 2 must be accepted as one species, *Casuarina montana* being only a climatic form of *Casuarina equisetifolia*. The author maintains that 8 falls of *Casuarina montana* brought to the plains, regresses to the seashore-form *C. equisetifolia*. On ethnographical and philological considerations the author considers the species as introduced into Java by the Hindoos.—*Charles Coster.*

9585. Ames, Oakes. **New or noteworthy orchids.** Schedulae Orchidianae 9. *1–62. Fig. 1–9.* July 22, 1925.—The present number in this series contains descriptions of 21 new species of Costa Rican orchids, a new orchid from Trinidad, British West Indies, and critical notes on previously published species. The illustrations are by Blanche Ames. The new species from Costa Rica are: *Eurystyles Standleyi*, *Stenorrhynchus navarrensis*, *S. Standleyi*, *Stelis nubis*, *S. Standleyi*, *S. triangulabia*, *Scaphosepalum Standleyi*, *Pleurothallis Aguilarii*, *P. casualis*, *P. navarrensis*, *P. quinqueseta*, *P. Standleyi*, *P. strumosa*, *Lepanthes Standleyi*, *Pachystele corallorrhiza*, *Hexisea Lankesteri*, *H. cuniculata* (*Fractiunguis cuniculatus* Schltr.), *Epidendrum fundi*, *E. Standleyi*, *Telipogon Standleyi*, *Cryptocentrum Standleyi*, and *Dichaea Standleyi*. *Pleurothallis archidiaconi* is described as a new species from Trinidad, British West Indies. The following new combination and new name are included: *Malaxis boliviana* (*Microstylis boliviana* Schltr.), *Bolivia;* and *Dendrobium bunuanense* (*D. appendiculoides* Ames, not J. J. Sm.).—*J. M. Greenman.*

9586. Baas-Becking. **Staphylaea colchica Stev. var. (nova) laxiflora Baas-Becking.** Mitteil. Deutsch. Dendrol. Ges. **31**: 124–129. *2 fig.* 1921.—*Staphylaea colchica* Stev. var. *laxiflora* Baas-Becking is described as new to science.—*J. C. Th. Uphof.*

9587. Baker, Ed., et É. De Wildeman. **Notes sur des formes congolaises nouvelles du genre Crotalaria. [Notes concerning the new forms of the genus Crotalaria from the Congo.]** Bull. Jard. Bot. Etat. Bruxelles 8: 129–141. 1923.—This study includes the diagnoses of *Crotalaria beniensis* De Wild., *C. cylindroides* Baker f. & Mart., *C. dolichonyx* Baker f. & Mart., *C. glauca* var. *beniensis* De Wild., *C. kikangaensis* De Wild. and var. *longifoliolata* De Wild., *C. maxillaris* Kl. var. *latifoliolata* De Wild., *C. megapteryx* Baker f. & Mart., *C. natalitia* Meyer var. *rutshuruensis* De Wild., *C. orthoclada* var. *Claessensi* De Wild., *C. oxthoibos* Baker f. & Mart., *C. pycnocephala* Baker var. *Claessensi* De Wild., *C. Wildemani* Baker f. & Mart. —*É. De Wildeman (translated by E. B. Payson).*

9588. Baker, Ed., et É. De Wildeman. **Sur quelques Indigofera du Congo belge. [Concerning some species of Indigofera from the Belgian Congo.]** Bull. Jard. Bot. Etat Bruxelles 8: 143–159. 1923.—The following new species and varieties of *Indigofera* are published: *I. affinis* De Wild.; *I. Baumiana* Harms var. *roseo-violacea* De Wild. and var. *Hocki* De Wild.; *I. carinata* De Wild.; *I. condensata* De. Wild; *I. divaricata* De Wild.; *I. erythrogramma* Welw. var. *pauciflora* Baker f. & Mart.; *I. kengeleensis* De Wild.; *I. pauciflora* De Wild.; *I. podocarpa* Baker f. & Mart.; *I. rutshuruensis* De Wild.; *I. secudiflora* Poir. var. *rubripilosa* De Wild.; *I. subargentea* De Wild.; *I. Zenkeri* Harms var. *brevifoliolata* De Wild. —*É. De Wildeman (translated by E. B. Payson).*

9589. Ball, Carleton R., and Kirk Whited. **Pruinose branchlets and Salix Lemmonii Bebb.** Amer. Jour. Bot. 12: 91–96. 1925.—A pruinose bloom ordinarily occurs on twigs of *Salix Lemmonii* Bebb which are 1 or 2 years old, but is nearly or quite absent on twigs of the season and on those more than 2 years old. On the basis of this fact the author includes *S. Austinae* Bebb under *S. Lemmonii* Bebb and redescribes the latter species.—*E. W. Sinnott.*

9590. Benoist, Raymond. **Descriptions d'espèces nouvelles de Phanérogames de la Guyane française. [New phanerogamic species from French Guiana.]** Bull. Mus. Hist. Nat. [Paris] 29: 594–597. 1923.—This article describes 6 new species and one new variety, as follows: *Lecythis Wachenheimii*, *L. tapuya*, and *L. retroflexa; Hirtella Wachenheimii*, *H. Melinonii*, *Couepia versicolor*, and *C. bracteosa* Benth. var. *grandifolia.*—*John M. Fogg, Jr.*

9591. Bornmüller, J. **Alnus incana (L.) Moench var. nov. ulmifolia Bornm.** Mitteil. Deutsch. Dendrol. Ges. 31: 118–121. *1 pl.* 1921.—*Alnus incana* (L.) Moench var. *ulmifolia* Bornm. is described as new from Thuringia.—*J. C. Th. Uphof.*

9592. De Wildeman, É. **Decades specierum novarum florae congolensis (Coll. Dr. J. Bequaert). [Decades of new species of the flora of Congo.]** Rev. Zool. Africaine (Suppl. Bot.) 8: B1–B20, B25–B47, 1920; 9: B1–B36, B69–B95, 1921; 10: B1–B13. 1922.—This series of papers records the results of critical studies of plants collected in Belgian Congo by J. Bequaert. The following new species are described: *Ceropegia Bequaerti*, *C. glabripedicellata*, *Echinops Bequaerti*, *Hypericum Bequaerti*, *H. ruwenzoriense*, *Peperomia Bequaerti*, *P. butaguensis*, *P. gracilipetiolata*, *P. emarginata*, *P. subdichotoma*, *Piper Bequaerti*, *Schefflera Bequaerti*, *S. congesta*, *S. tridentata*, *S. acutifoliolata*, *Erythrina Bequaerti*, *Kniphofia Bequaerti*, *Cynoglossum Bequaerti*, *Garcinia sordido-luteola*, *G. Bequaerti*, *Lobelia butaguensis*, *L. mokuluensis*, *L. rubescens*, *L. violaceo-aurantiaca*, *L. lanuriensis*, *L. Bequaerti*, *Maesa Bequaerti*, *Sclerochiton albus*, *S. cyaneus*, *S. Bequaerti*, *Brachystephanus Bequaerti*, *B. velutinus*, *Streptocarpus Bequaerti*, *S. masisiensis*, *Didymocarpus Bequaerti*, *Hebenstreitia Bequaerti*, *Cordia Bequaerti*, *Cycnium Bequaerti*, *C. brevifolium*, *C. rubrum*, *Celtis affinis*, *C. Bequaerti*, *C. ituriensis*, *C. dubia*, *Harveya Bequaerti*, *Maesa Bequaerti*, *M. butaguensis*, *M. rufo-velutina*, *M. ruwenzoriensis*, *Galium Bequaerti*, *Paropsia Bequaerti*, *Memecylon Bequaerti*, *M. cyaneum*, *Croton butaguensis*, *C. megalobotryoides*, *Albuca Bequaerti*, *A. fibrillosa*, *A. scabromarginata*, *Arisaema Bequaerti*, *A. masisiensis*, *Bulbophyllum albidum*, *B. Bequaerti* (*Megaclinium Bequaerti*), *B. ellipticum*, *B. ituriense*, *B. lanuriense* (*Megaclinium lanuriense*), *B. rubro-brunneo-papillosum*, *B. rubro-violaceum*, *B. subcoriaceum* (*Megaclinium subcoriaceum*), *B. unifoliatum*, *Schefflera angiensis*, *Loranthus angiensis*, *L. Bequaerti*, *L. bogoroensis*, *L. butaguensis*, *L. ituriensis*, *L. landanaensis*, *L. luteo-aurantiacus*, *L. mbogaensis*, *L. rugulosus*, *L. umbelliflorus*, *Jasminum Bequaerti*, *J. butaguense*, *J. rutshuruense*, *J. ruwenzoriense*, *Cordia Bequaerti*, *C. uncinulata*, *Oreosyce Bequaerti*, *Corallocarpus Bequaerti*, *Weihea Bequaerti*, *Viscum Bequaerti*, *Sebaea Bequaerti*, *S. butaguensis*, *Swertia tshitirungensis*, *Strychnos Bequaerti*, *S. brevicymosa*, *Antho-*

cleista Bequaerti, Alsodeiopsis Bequaerti, Tiliacora Bequaerti, Opilia ruwenzoriensis, and *O. angiensis*.—*J. M. Greenman.*

9593. De Wildeman, É. **Deux Carduus du Ruwenzori. [Two species of Carduus from Ruwenzori.]** Bull. Jard. Bot. Etat Bruxelles 8: 115–118. 1923.—*Carduus butaguensis* and *C. lanuriensis* are described, both from the Belgian Congo. The author also notes the presence of *C. kikuyorum* var. *Goetzenii* Fries at the foot of Nilagongo (collected by F. Delhaye).—*Author* (*translated by E. B. Payson*).

9594. De Wildeman, .É **Notes prêliminares sur deux bananiers indigènes du Ruanda cultivés au Jardin d'essai de Kisantu S. J. (Congo belge). [Preliminary note on two banana trees native to Ruanda cultivated in the experimental garden of Kisantu S. T. (Belgian Congo).]** Bull. Jard. Etat Bruxelles 8: 103–113. 1923.—In describing *Musa ruandensis* and *M. rubronervata*, the author abstracts the species of the same group listed from Africa. These 2 species are introduced into cultivation in Europe and America.—*Author* (*translated by E. B. Payson.*)

9595. De Wildeman, É. **Remarque sur les especes africaines du genre Grumilea Gaertn. [Remark on the African species of the genus Grumilea Gartn.]** Bull. Jard. Bot. Etat Bruxelles 9: 21–58. 1923.—The author reviews the African species of this genus and is led to describe the numerous species, of which 2 do not belong to the flora of the Belgian Congo. He calls attention to certain characters which he should restudy with care, for example, those drawn from the stipules. He insists on the myrmecophily of *G. refractistipula* and gives figures of the nest. The new species are: *G. albiflora, G. aruwimiensis, G. Bequaerti, G. Chevalieri* (French Congo); *G. ealaensis* (nom nov. = *Psychotria ealaensis*); *G. globulosobaccata; G. Ileka, G. ivorensis* (Ivory Coast)*; G. Laurentii* (*Psychotria Laurentii*)*; G. longipetiolata; G. quadrangularis;* and *G. Vermoeseni*.—*Author* (*translated by E. B. Payson*).

9596. De Wildeman, É. **Un Argyrolobium nouveau pour la flore du Congo. [A new Argyrolobium for the flora of the Congo.]** Bull. Jard. Bot. Etat Bruxelles 8: 126–127. 1923.—*Argyrolobium rufopilosum*, from the region of Kabango (Belgian Congo) is described as new. —*Author* (*translated by E. B. Payson*).

9597. De Wildeman, É. **Un Astragalus nouveau de la region du Rutshuru. [A new Astragalus from the region of Rutshuru.]** Bull. Jard. Bot. Bruxelles 8: 123–126. 1923.—*A. Bequaerti*, a species of the group of *A. abyssinicus* Steud. is described as new to science. —*Author* (*translated by E. B. Payson*).

9598. Fries, Rob. E. **Die Gattung Tolpis im tropischen Afrika. [The genus Tolpis in tropical Africa.]** Acta Horti Bergiani 8: 269–273. *1 pl.* 1925.—*Tolpis abyssinica* Schultz Bip., the only species of this genus hitherto reported from tropical Africa, was found to consist of 2 different species, 1 which should be referred to *T. altissima* Pers. and 1 new species described as *T. ephemera*. Further, *T. somalensis* is described as new.—*O. Heilborn.*

9599. Fries, Rob. E. **Die Sonchus-Arten des tropischen und südlichen Afrika. [The Sonchus-species of tropical and southern Africa.]** Acta Horti Bergiani 8: 89–121. *Pl. 1–3.* 1924.—From the above named region 29 species are now known (except a few incompletely described ones), several of which are described as new in this paper. The really indigenous species are all perennial. The leaf-shape is of little taxonomic value. Some of the species flower before the development of the leaves. These species are taxonomically related as shown by several other mutual peculiarities. Thus, most of them have 2 kinds of anthodium scales: short exterior and long interior ones. The corolla is in this genus of small, the fruit of great, taxonomic value. Thus, some groups of species have flattened, others cylindrical, fruits. The following groups are distinguished: *Schweinfurthii-, cornutus-, prenanthoides-, rarifolius-* and *lasiorhizus*-groups. The following species and forms are described as new: *Sonchus Schweinfurthii* Oliv. & Hiern. var. *camporum, S. Bipontini* Aschers. f. *glanduligerus* and var. *pinnatifidus* Oliv. & Hiern. f. *luxurians, S. afromontanus, S. melanolepis* Fresen. f. *stramineus* and var. *linearis, S. obtusilobus. S. stenophyllus, S. Wilmsii, S. integrifolius* Harv. f. *lobatus* and var. *Schlechteri, S. Ruepellii* (*Dianthoseris Ruepellii* Sch. Bip.), *S. Verdickii* (*Lactuca Verdickii* De Wild.), *S. pycnocephalus*, and *S. Ledermannii.* A key is given for all species dealt with and a species index concludes the work.—*O. Heilborn.*

9600. Fries, Rob. E. **Zur Kenntnis der scrophulariaceen des tropischen Ostafrika. [Scrophulariaceae of tropical East Africa.]** Acta Horti Bergiani 8: 45–70. *Pl. 1–2, 4 fig.*

1924.—The following new species and varieties are described: *Diclis bambuseti*, *Limosella macrantha*, *Lindernia Whytei* Skan f. *insignis*, *Veronica abyssinica* Fresen. f. *subnuda*, *V. keniensis*, *V. aberdarica*, *V. linnaeoides*, *V. Baltiscombei*, *Rhamphicarpa Volkensii* (Engl.) Skan var. *keniensis*, *Bartsia nyikensis*, *B. elgonensis*, *B. keniensis*, and *B. macrocalyx*. Keys are given for all *Veronica* species from the African high mountains and for all tropical African species of *Bartsia*. The *Veronica* species from Mount Kenia and Aberdare form a small group with 5 lobed corolla, 2 species occurring on the 1 mountain and 2 parallel ones on the other. *Veronica* species with 5-lobed corolla were formerly known only from New Zealand.—*O. Heilborn.*

9601. [Grossgeim, A. A.] Гроссгейм, А. А. **Об изменчивост и Ranunculus sceleratus L. в Талыше.** [The variability of Ranunculus sceleratus L. in Talysch.] Вестник Тифлисского Ботанического Сада. Новая Серия Вып [Monitor Tiflis Bot. Gard. n. s.] **1:** 1–23. *8 fig.* 1922–1923.—The author investigated the morphological and anatomical structure of the achenes of *Ranunculus sceleratus* L. in Talysch, and described a series of forms of this species which distinguish themselves through the structure of the achenes. The forms characterized are: *R. sceleratus* L. f. *leiocarpus*, f. *intermedius*, f. *spongiocarpus*, and f. *dolosus* (*R. dolosus* Fisch. & Mey.).—*L. J. Pessin.*

9602. Guillaumin, A. **Plantes nouvelles des serres du Muséum.** [New plants from the greenhouses of the Muséum.] Bull. Mus. Hist. Nat. [Paris] **29:** 543–544. 1923.—Two new species are described from material growing in the greenhouses of the Muséum d'Histoire Naturelle (Paris), namely *Polystachya inaperta*, thought to have been collected in French Guinea, and *Begonia trullaefolia*, collected in Madagascar.—*John M. Fogg, Jr.*

9603. Hartwig, Karl Gustav. **Populus canadensis Moench. und Populus monilifera Aiton.** Mitteil. Deutsch. Dendrol. Ges. **32:** 170–172. *1 fig.* 1922.—It is sometimes stated that *Populus canadensis* only female and of *P. monilifera* only male inflorescences are known. Therefore it was supposed by some botanists that they were the male and female trees of the same species. The writer, however, demonstrates by drawings the differences between the 2 species. He asks that herbarium plants be sent to him with male flowers of *P. canadensis* and female flowers of *P. monilifera.*—*J. C. Th. Uphof.*

9604. Hayata, Bunzo. **Contributions to the flora of Formosa. VIII.** Icones Plantarum Formosanarum **10** (IV): 1–74. *Fig. 1–48.* 1921.—The following species and varieties are described as new: *Viola acutilabella*, *V. Matsudai*, *Chisocheton erythrocarpa* Hayata & Kanehira, *Entada koshunensis* Hayata & Kanehira, *Gynostemma pedata* Blume var. *trifoliata*, *Trichosanthes formosana*, *T. hainanensis*, *T. homophylla*, *T. koshunensis*, *T. Matsudai*, *T. Miyagii*, *T. mushaensis*, *T. punctata*, *T. schizostroma*, *Zehneria kelungensis*, *Sium formosanum*, *Pimpinella astilbaefolia*, *Conioselinum morrisonense*, *Peucedamum formosanum*, *Angelica Morii*, *Angelica? tarokoensis*, *Loranthus Matsudai*, *Lithocarpus shinsuiensis* Hayata & Kanehira, *Zingiber Kawagoii*, *Dioscorea kelungensis*, *D. Matsudai*, *D. pseudojaponica*, *D. raishaensis*, *D. tarokoinsis*, *D. Tashiroi*, *Eriocaulon formosamum*, *E. nantoense*, *E. pachypetalum*, *E. petrosepalum*, *E. suishaense*, *Carex remotispicula*, *C. pachinensis*, *C. shichiseitensis*, *C. taiheiensis*, *C. uraiensis*, *C. daibuensis*, *C. dolichostachya*, *C. gracilispica*, *C. kelungensis*, *C. rankanensis*, *C. gokwanensis*, *C. longistipes*, *C. hoozanensis*, *C. remotiflora*, *C. sharyotensis*, *C. taihokwensis*, **Diplocarex**, new genus, *D. Matsudai*, *Lycopodium remoganense*, *Hymenophyllum retusilobum*, *Cyclophorus Matsudai*. The flora of Formosa up to the present date contains, as far as is known, 3,658 species and 79 varieties, belonging to 1,197 genera and 170 families. This paper contains, in addition to the species and varieties already listed, references to plants not previously reported from Formosa and illustrations of many of the newly proposed species.—*E. B. Payson.*

9605. Hickel, R., et A. Camus. **Castanopsis nouveaux d'Indo-Chine.** [New species of Castanopsis from Indo China.] Bull. Mus. Hist. Nat. [Paris] **29:** 534–536. 1923.—Seven new species of *Castanopsis* from Annam, Cambodge, and Laos are described as follows: *C. pseudindica*, *C. Gamblei*, *C. cambodiana* A. Chevalier, *C. nhatrangensis*, *C. Oerstedii*, *C. arietina*, and *C. torulosa*. The authority, save where noted, is R. Hickel and A. Camus.—*John M. Fogg, Jr.*

9606. Hickel, R., et A. Camus. **Fagacées nouvelles d'Indo-Chine: Genre Quercus L.** [New Fagaceae from Indo China: Quercus.] Bull. Mus. Hist. Nat. [Paris] **29:** 598–601. 1923.—

Ten new species of *Quercus* are described, mostly from Annam, and Tongking. The authority in each case is given as Hickel & A. Camus. New species are as follows: *Quercus setulosa, Q. chapensis, Q. arbutifolia, Q. geminata, Q. rupestris, Q. Thorelii, Q. Fleuryi, Q. cambodiensis, Q. asymetrica,* and *Q. flavescens.—John M. Fogg, Jr.*

9607. Hickel, R., et A. Camus. **Fagacées nouvelles d'Indo-Chine: Genre Pasania Oerst. [New Fagaceae from Indo China: Pasania.]** Bull. Mus. Hist. Nat. [Paris] **29**: 602–606. 1923.—This article describes 11 new species of *Pasania* from Indo-China. The authority in each case except where noted is given as Hickel & A. Camus. Following are the new species: *Pasania Ducampii, P. parvula, P. sphaerocarpa, P. Paviei, P. Rouletii, P. coinhensis, P. trachycarpa, P. pachycarpa, P. echinocarpa, P. annamitorum* A. Chevalier, and *P. coalita.—John M. Fogg, Jr.*

9608. Khek, Eugen. **Cirsium murrianum Khek (C. canum [L.] Mönch × heterophyllum [L.] Hill).** Ann. Naturhist. Mus. Wien. **38**: 96–97. 1925.—A technical description is given of the new hybrid mentioned in the title.—*A. S. Hitchcock.*

9609. Kimport, Katrina. **Notes on the genus Pentstemon of the Gunnison area.** Bull. Western State Col. Colorado **14**^{2}: (Publ. in Biol. **1**^{2}): 1–15. *Pl. 1–2.* 1924.—The author has made a study of the pentstemons in the region of Gunnison, Colorado, recording 13 species of which *Pentstemon almontii* and *P. gunnisonii* are described as new.—*J. M. Greenman.*

9610. [Korovin, E. P.] Коровин, Е. П. **Genus novum umbelliferarum ex Turkestania. [A new genus of the Umbelliferae from Turkestan.]** Trans. Sci. Soc. Turkestan **1**: 85–88. *1 pl.* 1923.—The author describes a new genus of the Umbelliferae; in honor of Professor Koso-Poljansky it is named **Kosopoljanskia** and one species, *K. turkestanica,* is characterized. For the salt-bearing rocks of Boukharie the archaic *Schrenkia insignis* is characteristic, and so is *Kosopoljanskia* for the analogical rocks in Aulie-atinsk Province. The *Kosopoljanskia* produces the link with the *Führnrohria* from the mountainous part of Armenia, the *Coriandrum* from the Mediterranean and with the *Tschschurowskia* split off from the now disappeared prototype of Coriandreae.—*V. Lashevsky.*

9611. [Korovin, E. P.] Коровин, Е. П. **Species novae turkestanicae g. Acantholimonis. [New Turkestan species of the genus Acantholimon.]** Trans. Sci. Soc. Turkestan **1**: 79–84. 1923.—*Acantholimon* has a large part in the formation of the landscape of Turkestan. The author describes the following new species of this genus: *Acantholimon balchanicum, A. marmoreum, A. purpureum, A. gramineum, A. talassicum,* and *A. compactum.—V. Lashevsky.*

9612. Lacaita, C. **Piante italiane critiche o rare. (XCVIII-CII). [Rare and doubtful Italian plants.]** Nuovo Gior. Bot. Italiano n.s. **32**: 102–114. *Pl. 1–5.* 1925.—*Centaurea diomedea* Gasp. var. *iapygica, C. leucadea,* and *Valeriana montana* L. var. *auriculata,* are described as new. *Aquilegia Ottonis* Orph. has been collected for the first time on Mt. Alburno in Salernitano, Italy. The Italian plant given as *Colchium montanum* by Grande (*Ibid.* **31**: 119. 1924.) is *C. Bertolonii* Stev. The name *C. montanum* L. should be abandoned.—*P. D. Caldis.*

9613. Macbride, J. Francis. **South American plants mostly from the Captain Marshall Field Expedition to Peru 1922 and 1923.** Field Mus. Nat. Hist. Publ. 231, Bot. Ser. **4**: 79–93. 1925.—The author proposes the following new species, new names, and new combinations: *Hesperomeles Fieldii, Psoralea munyensis, P. maleolens, P. Featherstonei, P. potens, Parosela ayavacensis* (HBK.), *Coursetia perplexans* (*Cracca poliophylla* Harms), *C. fruticosa* (Cav.), *Machaerium Schunkei, Rhynchosia apoloensis* (Rusby), and *Malesherbia Galjufii* from Peru; *Tephrosia diversifolia* (Rose), *T. cuernavacana* (Rose), *T. Pringlei* (Rose), *T. Watsoniana* (Standl.), and *T. lanata* Mart. & Gal. var. *velutina* (Rydb.) from Mexico; *Machaerium Pittieri* (*M. latifolium* Pittier, not Rusby) from Central America, and *Columellia Andrei* from Ecuador. There are also notes on a number of other Peruvian plants, a key to the Psoraleas of Peru and a discussion of the confusion caused by the use of *Cracca* Benth. for *Benthamantha* so long as some authorities retain *Cracca* L. for *Tephrosia.—Edith M. Vincent.*

9614. Martelli, U. **On a new species of Pandanus from North Queensland.** Proc. Roy. Soc. Queensland **36**: 129–130. *Pl. 24.* 1925.—The new species is named *Pandanus Whitei* and belongs to the section Keura.—*W. D. Francis.*

9615. Merrill, E. D. **Additions to our knowledge of the Philippine flora, I.** Philippine

Jour. Sci. **26**: 447–496. 1925.—Three genera and 54 species are added to the known list of Philippine plants, the following being described as new: *Pandanus depauperatus, P. calamianensis, P. busuangaensis, P. paracalensis, Raphidophora palawanensis, Aglaonema stenophyllum, Cyclea cauliflora, Goniothalamus mindorensis, Mitrephora caudata, Oxymitra mindorensis, Uvaria qoloensis, Clausena citriodora, Triphasia grandifolia, Amoora mindorensis, Dysoxylum angustifoliolum, D. brachybotrys, Glochidion lancilimbum, G. Cenabrei, G. Woodii, Phyllanthus anisophyllaeoides, Glyptopetalum palawanense, Mappia philippinensis, Ilex permicrophylla, Allophylus Lopezii, Elaeocarpus halconensis, Saurauia zamboangensis, Garcinia busuangaensis, G. pacifica, G. ituman, G. Whitfordii, Shorea kalunti, Begonia angilogensis, B. Woodii, B. pinamalayensis, B. coronensis, B. zamboangensis, B. parvilimba, B. supprostrata, Schefflera angilogensis, Ardisia Alvarezii, Discocalyx leytensis, Mastixia crassifolia, Diospyros calcicola, Lettsomia philippinensis, Radermachera brachybotrys, Didymocarpus Woodii, Hypoestes halconensis, Viburnum cornutidens, Prismatomeris obtusifolia, Psychotria Merrittii, Timonius pachyphyllus, Wendlandia Warburgii,* and *Williamsia mimica.—Author.*

9616. Merrill, E. D. **Five new species of Chinese plants.** Philippine Jour. Sci. **27**: 161–166. 1925.—*Elatostema Stewardii, Caesalpinia Tsoongii, Meliosma Stewardii, Lagerstroemia Limii* and *Embelia hainanensis* are described as new.—*Author.*

9617. Merrill, E. D. **New species of Philippine plants collected by A. Loher.** Philippine Jour. Sci. **27**: 21–59. 1925.—Forty-one new species are described from collections made in Luzon by Loher between the years 1908 and 1915, as follows: *Pilea Loheri, Cinnamomum Loheri, Cryptocarya Loheri, Bauhinia pachyphylla, Micromelum caudatum, Clausena Loheri, Dysoxylum Loheri, Xanthophyllum Loheri, Gelonium stenophyllum, Dimorphocalyx Loheri, Ilex Loheri, Kokoonia luzoniensis, Siphonodon pyriformis* Merr. var. *parvifolius, Turpinia pachyphylla, T. simplicifolia, Harpullia arborea* (Blanco) Radlk. var. *megalocarpa, Saurauia Loheri, Garcinia Loheri, Homalium obovatum, H. polillense, Eugenia diospyrifolia, E. caudatilimba, E. crassilimba, E. megalophylla, Vaccinium rizalense, Diplycosia Loheri, Embelia Loheri, Palaquium elliptilimbum, P. Loheri, Linociera phanerophlebia, Fagraea Loheri, Rauwolfia Loheri, Parsonsia oblongifolia, Carruthersia axilliflora, Melodinus lanceolatus, Tylophora lancilimba, Gymnostachyum trichosepalum, Peristrophe caudatifolia, Pavetta Loheri, Randia Loheri, Uncaria luzoniensis, Williamsia Loheri,* and *W. stenophylla.—Author.*

9618. Millspaugh, C. F. **Two new Euphorbias.** Field Mus. Nat. Hist. Publ. 231, Bot. Ser. **4**: 95. 1925.—The author describes *Tithymalus raphanorrhizus* and *T. pencillatus* from material collected by Macbride and Featherstone on the 1922 Captain Marshall Field Botanical Expedition to Peru.—*Edith M. Vincent.*

9619. Pellegrin, François. **Plantae Letestuanae novae ou Plantes nouvelles récoltées par M. Le Testu de 1907 à 1919 dans le Mayombe congolais. [New plants collected by Le Testu in Mayomba.]** Bull. Mus. Hist. Nat. [Paris] **29**: 591–593. 1923.—Three new species are described, as follows: *Lindackeria (Oncoba) ngounyense, Pterygota Augouardii,* and *Sterculia bayakenis.—John M. Fogg, Jr.*

9620. Piper, C. V. **Two new species of Canavalia.** Field Mus. Nat. Hist. Publ. 231, Bot. Ser. **4**: 94. 1925.—*Canavalia eurycarpa* and *C. peruviana* are described from specimens collected in Peru by J. Francis Macbride on the Captain Marshall Field Botanical Expedition of 1923.—*Edith M. Vincent.*

9621. Pleijel, Carl. **Skandinaviens samkönade Valeriana-former. [Hermaphrodite forms of Valeriana in Scandinavia.]** (German summary.) Acta Horti Bergiani **8**: 71–87. *4 fig.* 1924.—The hermaphrodite forms of *Valeriana* in Scandinavia and their ways of immigration are dealt with. *V. officinalis* L. has probably immigrated from the south by the Danish islands. It generally occurs as a halophyte along the sea-shores. *V. excelsa* Poir. has apparently immigrated from the east through Finland and is now the most wide-spread species in Scandinavia. *V. baltica* C. Pleijel, described from Livland, apparently no longer occurs in the latter country; it apparently now exists only in the small Island of Lucerna outside the town of Västervik on the east coast of southern Sweden. *V. salina* is described as new. This species occurs along the northern parts of the Baltic Sea and is the dominant form in the archipelago of Stockholm, Uppland, and Gävle, and in southwestern Finland.

It also occurs in the Åland Islands. The author is of the opinion that the species has originated within this region, probably from the hybrid *V. excelsa* × *officinalis*. *V. baltica* × *excelsa* is described as a new hybrid. All specimens of *V. exaltata* Mikan, examined by the author, belong to the hybrid *V. excelsa* × *officinalis*.—*O. Heilborn.*

9622. Rechinger, Karl. **Neue Hybriden aus den Gattungen Rumex und Cynoglossum. [New hybrids in the genera Rumex and Cynoglossum.]** Ann. Naturhist. Mus. Wien **38**: 150–152. 1925.—New hybrids are described as follows: *Rumex peisonis* Reching. (*R. paluster* Sm. × *Patientia* L.); *R. leptophyllus* Murb. & Reching. (*R. fennicus* Murb. × *obtusifolius* L.); *R. Hayekii* Reching. (*R. crispus* L. × *recurvatus* Reching.); *Cynoglossum austriacum* Reching. (*C. hungaricum* Simonk × *officinale L.*).—*A. S. Hitchcock.*

9623. St. John, Harold, and Charles S. Parker. **A tetramerous species, section, and subgenus of Carex.** Amer. Jour. Bot. **12**: 63–68. *Pl. 7.* 1925.—*Carex concinnoides* Mackenzie, of western North America, with 4 stigmas and tetragonous achenes, is placed in a new section, *Tetragonae,* and a new subgenus, *Altericarex.*—*E. W. Sinnott.*

9624. Sargent, C. S. **Notes on Crataegus.** Jour. Arnold Arboretum **6**: 1–5. 1925.—The author points out that *Crataegus olivacea* Sargent is identical with *C. Fontanesiana* (Spach) Steud., notes a number of other changes in the nomenclature of the genus, and publishes the following new names: *Crataegus sordida* var. *villosa*, *C. neosmithii*, *C. neofaxonii*, *C. Ridgwayi*, × *C. Whitakeri*, *C. diversifolia*, and *C. padifolia* var. *incarnata.*—*Alfred Rehder.*

9625. Schaefer, Albert. **Zwei Formen von Cupressus arizonica. [Two forms of Cupressus arizonica.]** Mitteil. Deutsch. Dendrol. Ges. **31**: 323–325. *2 fig.* 1921.—*Cupressus arizonica* f. *typica* and *f. patens* are described as new.—*J. C. Th. Uphof.*

9626. Schwerin, Fritz von. **Die Douglasfichte. [The Douglas spruce.]** Mitteil. Deutsch. Dendrol. Ges. **32**: 53–67. *4 fig.* 1922.—*Pseudotsuga taxifolia* (Lamb.) Britt. subsp. *mucronata* (Raf.) f. *albispica* and *P. taxifolia* subsp. *glaucescens* (Bailly) f. *caesia-erecta* are described as new forms.—*J. C. Th. Uphof.*

9627. Schwerin, Fritz von. **Die Formen der Picea pungens. [The forms of Picea pungens.]** Mitteil. Deutsch. Dendrol. Ges. **29**: 231–235. 1920.—The following new forms of *Picea pungens* Engelm. are characterized: f. *typica*, f. *atriviridis*, f. *pendula*, and f. *perpendicularis.*—*J. C. Th. Uphof.*

9628. Schwerin, Fritz von. **Sechs neue Laubgehölzformen. [Six new forms of trees and shrubs.]** Mitteil. Deutsch. Dendrol. Ges. **31**: 322–323. 1921.—*Acer pseudoplatanus cucullatum*, *Fraxinus ornus monophylla*, *Parthenocissus Veitchii pulverulentus*, *Prunus laurocerasus Fiesserana*, *Salix Schoeniana* (= *S. triandra* × *purpurea*), *Sambucus nigra Hessei*, and *Pseudotsuga Douglasii* (var. *glauca*) f. *densiramea* are described as new to science.—*J. C. Th. Uphof.*

9629. Sorger, Otto. **Die systematische Stellung von Taiwania cryptomerioides Hayata. [The systematic position of Taiwania cryptomerioides Hayata.]** Oesterreich. Bot. Zeitschr. **74**: 81–102. *3 fig.* 1925.—*Taiwania cryptomerioides* was discovered by N. Konishi on Formosa in 1904, and was described by Hayata as a new genus of the Coniferae in 1906. Hayata placed the genus between *Cunninghamia* and *Athrotaxis*. The material investigated by the author was found in the year 1916 by Handel-Mazzetti in the Province of Yunnan, China, in mesophytic forests at an altitude of 2175–2350 meters. The typical cupressoid bordered pits, superimposed and crossed, prove the affinity to the Cupressaceae. There is no difference between the typical cupressoid built wood and that of *Cunninghamia*, having large glyptostroboid bordered pits. The anatomy of the leaves shows a conformity with *Athrotaxis*. The ramification of the vascular bundle in the squamiform leaf is characteristic for both, just as much as the great brachysclereides. Besides, *Taiwania* has sickle-shaped leaves similar to those of *Cryptomeria*. *Cunninghamia* has a different size of leaves and other anatomical structures. The female flowers of *Taiwania* correspond to those of *Cryptomeria* and *Athrotaxis;* they stand in terminal inflorescences. In *Cunninghamia* they are capitate and accumulated. In contradistinction to the 3 other genera the ovules in *Cryptomeria* are upright. The number of them is of little importance; it varies within the single genus. With regard to the size of the male inflorescence, *Taiwania* corresponds only to *Cunninghamia;* the flowers are capitate and accumulated. The flowers have 2–4 pollen-sacs like those of

Cunninghamia and *Athrotaxis cupressoides*. According to the anatomical and morphological conditions the author concludes that there is the closest relationship with the genus *Athrotaxis*. It seems that plant-geographical considerations are against that relationship because *Taiwania* inhabits the northern and *Athrotaxis* on the contrary the Southern Hemisphere. But palaeontological investigations have demonstrated that, at least, forms living on the Northern Hemisphere, are related to *Athrotaxis*. Among the fossil forms *Taiwania* has the closest affinity with the *Voltzieae* having in common with them the heterophyllous characteristics.—*H. Cammerloher* (*translated by R. La Garde*).

9630. [Sosnovskii, D. I.] Сосновский, Д. И. **Новые и критические срормы кавказской Флоры.** [New and critical forms of the flora of the Caucasus.] Вестник Тифлисского Ботанического Сада Новая серия. [Monitor Tiflis Bot. Gard. n. s.] **1**: 73–82. 1922–1923.—The author describes the following new species: *Dianthus atschurensis*, *Epimedium circinnato-cucullatum*, *Salvia Trautvetteri*, *Carpoceras longistyla*, and *Pyrethrum kaghyzmanicum*. *Cerastium argenteum* MB. subsp. *glabratum* is given as a new combination, based on *C. grandiflorum* W. & K. var. *glabra* Trautv.; and an emended description is given of *Saxifraga Kolenatiana* Regel.—*L. J. Pessin.*

9631. Späth, Helmut. **Spiraea ariifolia (Holodiscus discolor) forma carnea.** Mitteil. Deutsch. Dendrol. Ges. **31**: 320–322. 1921.—*Spiraea ariifolia* f. *carnea* is described as new. It originated as a seedling of the white flowered *S. ariifolia*.—*J. C. Th. Uphof.*

9632. Sprenger, Carl. **Beobachtungen an einigen Yucca-Arten.** [Observations on some Yucca species.] Mitteil. Deutsch. Dendrol. Ges. **29**: 138–149. 1920.—*Yucca brasiliensis* is a doubtful name. Different forms of *Y. Treculeana* are described, also the variegated *Y. recurvifolia*.—*J. C. Th. Uphof.*

9633. Sprenger, Carl. **Zwei neue Formen der Sophora.** [Two new forms of Sophora.] Mitteil. Deutsch. Dendrol. Ges. **31**: 322. 1921.—*Sophora japonica* f. *floribunda* and *S. japonica* f. *rubella* are described as new from the Island of Corfu.—*J. C. Th. Uphof.*

9634. Teuscher, H. **Bestimmungstabelle für die in Deutschlands Klima kultivierbaren Pinus-Arten.** [Key for the Pinus species that can be grown in Germany.] Mitteil. Deutsch. Dendrol. Ges. **31**: 68–114. *4 pl.* 1921.—Forty species and subspecies are described and accompanied by a key.—*J. C. Th. Uphof.*

9635. Ulbrich, E. **Benennung und Formenkreis des Besenginsters.** [Nomenclature and forms of broom.] Mitteil. Deutsch. Dendrol. Ges. **31**: 129–137. *2 pl.* 1921.—The writer describes various forms of *Sarothamnus scoparius* (L.) Koch; he also gives several German names. Dendrologically of importance is the beautiful variety *Andreanus* with dark golden-yellow flowers. Twigs of the wild plants are made into baskets and mats.—*J. C. Th. Uphof.*

9636. Wolf, Egbert. **Dendrologische Mitteilungen.** [Dendrological notes.] Mitteil. Deutsch. Dendrol. Ges. **32**: 211–215. 1922.—*Sorbus thianschanica* Rupr. var. *pulcherrima* is described as a new variety from Turkestan; and *Juniperus Niemannii* is described as a new species from the Kola Peninsula, Russia.—*J. C. Th. Uphof.*

9637. Wolf, Egbert. **Neue Gehölze aus dem dendrologischen Garten des Leningrader Forst-Institutes.** [New woody plants from the dendrological garden of the Leningrad Forest Institute.] Mitteil. Deutsch. Dendrol. Ges. **34**: 324–334. 1924.—The following woody plants are described as new: *Acer circinatum* Pursh f. *connivens*, *A. circinatum* f. *horizontale*, *Berberis vulgaris* L. f. *ornata*, *Caragana frutex* K. Koch var. *puberula*, *Cotoneaster polyanthema*, *Lonicera Maximowiczii* Rupr. f. *divisa*, *L. Maximowiczii* var. *procera*, *Potentilla fruticosa* L. var. *multipinnata*, *Prunus baldschuanica* Rgl. f. *heteromera*, *P. incana* var. *vulgaris* (Spach) f. *rosea* and f. *alba*, *Ribes nigrum* L. var. *caucasicum*, *R. nigrum* var. *praecox*, *R. nigrum* var. *sibiricum*, *R. nigrum* f. *transformatum*, *Rosa purpurissata* n. hyb. (= *R. rubrifolia* × *R. rugosa*), and *Pseudotsuga taxifolia* (Lamb.) Britt. subsp. *mucronata* f. *microcarpa*.—*J. C. Th. Uphof.*

REVISIONS AND MONOGRAPHS

9638. Alm, C. G., and Th. C. E. Fries. **Monographie der Gattung Blaeria L.** [Monograph of the genus Blaeria L.] Acta Horti Bergiani 8: 221–268. *Pl. 1–14, 2 fig.* 1924.—All species of this genus are dwarf-bushes, generally with small, needle-like leaves. The flowers generally form spike-like inflorescences. The chief taxonomic characteristics of the different species are found in the flowers. Shape and length of the calyx-lobes, size and shape of corolla and anthers are of great importance. The anthers of the South African species are long and narrow, those of the tropical African species are relatively short and stout. The base of the anthers generally carries a cornute appendix the length of which, however, according to the author's experience, shows small specific differences, contrary to the opinion of previous authors. An historical review is given of the taxonomic literature on the genus. The genus is known only from Africa and occurs on this continent in 2 different regions, widely separated from one another, 1 smaller in South Africa and 1 larger in tropical Africa. In the South African region 9 species are found, belonging to the subgenus *Eu-Blaeria* and distributed in 5 groups that show no nearer taxonomic interrelations. In the tropical African region, 21 species are found, belonging to the subgenus *Blaeriastrum*, that can not be divided into any marked types. The tropical African species occur in the higher parts of the continent. The species of the isolated mountains are often endemic, corresponding species occurring on different mountains. The subgenera *Eu-Blaeria* and *Blaeriastrum* are described as new, as well as the following species, varieties, and combinations: *Blaeria Klotzschii* (*B. pusilla* Klotzsch, not L.), *B. sagittata* (*Erica sagittata* Klotzsch), *B. Mannii* Engl. f. *parviflora* and var. *bambuttensis*, *B. Stolzii*, *B. keniensis*, *B. saxicola* (*B. Meyeri Johannis* K. Schum & Engl. var. *saxicola*), *B. Filago* and var. *afromontana*, *B. viscosa* and var. *elgonensis*, *B. Granvikii*, *B. kilimandjarica*, *B. breviflora* Engl. var. *aberdarica*, and *B. patula* Engl. var. *tenuis*. Finally, a list is given of "species a genere removendae," as well as a species-index, also containing the synonyms.—*O. Heilborn.*

9639. Boulenger, G. A. **Les roses d'Europe de l'Herbier Crepin (Grande-Bretagne, France, Belgique, Pays-Bas, Suisse, Allemagne). [The roses of Europe in the Crepin Herbarium (Great Britain, France, Belgium, Holland, Switzerland, Germany).]** Bull. Jard. Bot. Etat Bruxelles **10**: 1–192. 1924.—Boulenger proposes a revision of the Crepin Herbarium which is preserved in Bussels and from this examination draws a number of conclusions. He wishes in particular to show that "the difference between species rests only on the combinations of characters which it is impossible to express in short diagnoses or with less reason by the aid of dichotomous keys. Certainly in taxonomy much is, and will be, arbitrary, for in the conception of a species the personal impression will chiefly determine the final treatment. In the first facicle of his work the author studies the group, Pimpinelli-Suavifoliae, of the Eglanteriae. Of a member of this group, *Rosa pimpinellifolia* L., he gives an ample synonymy and a very detailed description with notes and figures of the variable characters of the spiny twigs, of the leaflets, stipules, the buds and the flowers. To this species he refers the varieties *Riparti* (Desegl.) Dumort. and *myriacantha* (DC.) Ser. which he treats in the same way. He then examines in the same manner *R. sicula* Tratt., *R. rubiginosa* L. and var. *rotundifolia* Rau, and var. *Lintoni* (Scheutz) Bouleng. (= *R. coriifolia* v. *Lintoni* Scheutz and *R. Lintoni* H. Harrison). Some remarks are published here concerning *R. coriifolia* and *R. glauca* which he will treat in detail later. He then passes to the examination of *R. inodora* Fries of which he recognizes the variety *Cornazi* (Gremli) Boulenger (= *R. Cornazi* Gremli). For *R. agrestis* Sav. no varieties are admitted. To *R. micrantha* Sm. he adds the following varieties: *dimorphacantha* (Martinis) Boulenger (= *R. dimorphacantha Martinis*, *R. rubiginosa* var. *dimorphacantha* Aigret), *Bridgesii* Baker, *Gremlii* (Christ) Schwartz, *flagellaris* (Christ) Boulenger (= *R. rubiginosa* f. *flagellaris* Christ). The author lists a very large number of plants, species or varieties, which he has not been able to classify in a definite way. There still remain many points to elucidate but the actual state of our knowledge of the forms of this group of the genus *Rosa* has been faithfully shown and this study will serve to make these plants better known. The author shows by means of a diagram the relationships of the species studied, as he sees them. *R. pimpinellifolia* is the point of departure. *R. sicula* and *R. rubiginosa* are found on the same diagram, the latter alone having relationships on one side with *R. inodora* and *R. agrestis* and on the other with *R. micrantha.*—*É. De Wildeman (translated by E. B. Payson).*

9640. De Wildeman, É. **Documents pour une monographie des Alchemilla d'Afrique. [Papers for a monograph of the African Alchemillas.]** Bull. Jard. Bot. Etat. Bruxelles 6:

207–221. 1921.—This is a revision of papers relative to this genus, treating particularly of the region of Ruwenzori. Several new species are described, as follows: *A. affinis*, *A. Bequaerti*, *A. butaguensis*, *A. dubia*, *A. emarginata*, *A. keniensis*, and *A. microphylla*.—*Author (translated by E. B. Payson).*

9641. De Wildeman, É. **Documents pour une monographie des Alchemilla d'Afrique. [Papers for a monograph of Alchemilla in Africa.]** Bull. Jard. Bot. Etat. Bruxelles **7**: 317–386. 1921.—These papers comprise: I. Observations on the Alchemillas of Madagascar with a distributional table and a key. The new species are: *A. Baroni* (= *A. bifurcata* Hilsen & Bojer p.p.); *A. Humberti; A. Lecomtei; A. Perrieri* and var. *glabra; A. Viguieri*. The other Madagascan species are described in detail: *A. bifurcata* (Bojer) Hils., *A. Heldebrantii* Engl., *A. madagascariensis* O. Hoffm., *A. capensis* Thunb., *A. Rutenbergii* O. Hoffm., *A. schizophylla*. II. A study of *Alchemilla* of the group Pedatae Engler, with a table showing the distribution in Africa, an analytic key and detailed descriptions of most of the kinds. The novelties are: *A. Bakeri* (Natal); *A. Gerrardi* (Natal) and var. *hirsuto-petiolata* (South Africa); *A. Mukuluensis* (Ruwenzori, Eldoma); *A. Volkensii* Engler var. *bracteata* (Kilimanjaro) and var. *penicellata* (East English Africa). III. A 3rd paper contains a study of *Alchemilla*, group Subochreatae Engler, and also with an analytic key and a distributional table. The new species are: *A. aberdarensis* (Aberdare), *A. Alluaudi* (Kenia); *A. Bolusi* (South Africa); *A. Brownei* (Kenia); *A. geranioides* Rolf var. *major* (Ruwenzori); *A. Johnstonii* liv. var. *crenato-stipulata* (Kenia); *A. Nyikensis* (Nyika plateau). IV. Another chapter is devoted to a study on the same plan of the group, Latilobae Engler. The following are described as new: *A. Chevalieri* (San Thomé), and *A. subreniformis* (eastern Congo).—*Author (translated by E. B. Payson).*

9642. De Wildeman, É. **Notes sur les espèces Africaines du genre Dichapetalum Thou. [Notes on the African species of the genus Dichapetalum Thou.]** Rev. Zool. Africaine (Suppl. Bot.) **6**^{2}: B1–B75. 1919.—The author presents a review of the genus *Dichapetalum*, and gives an alphabetical list of the African species including the following species which are new to science: *Dichapetalum abrupti-acuminatum, D. Boydi, D. Butayei, D. divaricatum, D. dundusanense, D. fulvialabastrum, D. glandulosum, D. griseisepalum, D. Lescrauwaeti, D. lokanduense, D. longipedicellatum, D. lukolelaense, D. luteiflorum, D. Malchairi, D. Mortehani, D. Oddoni, D. Pynaerti, D. Reygaerti, D. sankuruense, D. Sapini*, and *D. ubangiense*.—*J. M. Greenman.*

9643. De Wildeman, É. **Notes sur des espèces congolaises du genre Milletia Wight et Arn. [Notes on the Congo species of Milletia.]** Bol. Soc. Broteriana **28**: 1–28. 1920.—Following reference to and comments on Dunn's Revision of the genus Milletia (Jour. Linn. Soc. Bot. **41**: 127–243. 1912), the author gives an enumeration of the species of *Milletia* of Belgian Congo including the following new species and varieties: *Milletia brunneosericea, M. Claessensi, M. discolor, M. Elskensi* and var. *quadrijuga, M. Hocki, M. limbutuensis, M. rubra, M. Sapini* De Wild. var. *longeacuminata, M. Sapini* De Wild. var. *subrubrosericea, M. Vankerckhoveni*, and *M. yangambiensis*.—*J. M. Greenman.*

9644. De Wildeman, É. **Observations sur des espèces africaines du genre Tephrosia Pers. [Observations on the African species of the genus Tephrosia Pers.]** Bull. Soc. Roy. Bot. Belgique **57**^{2}: 1–16. 1924 [1925].—This is a revision of the material of species of this genus received at the Botanical Garden of Brussels and determined in large part by Ed. Baker. The newly described species are: *T. atroviolacea* Baker f.; *T. barbigera* var. *subglabra* Baker f.; *T. Bequaerti* De Wild.; *T. humilis* var. *major* Baker f.; *T. Kassneri* Baker f; *T. lepida* Baker f.; *T. lessertioides* Baker f.; *T. mbogaensis* De Wild.; *T. rhizomatosa* De Wild.; *T. Ringoeti* Baker f.; and *T. subfalcatostipulata* De Wild. Most of these plants are from the Congo, a few, however, came from the English colonies of east Africa.—*Author (translated by E. B. Payson).*

9645. Kessell, S. L., and C. A. Gardner. **Key to the eucalypts of Western Australia.** Western Australia Forests Dept. Bull. **34**: 1–128. *Illus.* 1924.—Part 1 consists of keys to all eucalypts known to occur in the State, based on macroscopic vegetative features and arranged according to a decimal system devised by the authors. Part 2 includes descriptions of the arborescent species, with notes on the habitat and economic uses of each.—*W. N. Sparhawk.*

9646. McNair, James B. **The taxonomy of poison ivy with a note on the origin of the generic name.** Field Mus. Nat. Hist. Publ. 225, Bot. Ser. 4: 55–78. *Pl. 14–24.* 1925.—The author discusses the etymology of the name *Rhus* and its probable derivation from Greek or some kindred Asiatic language. He gives a key contrasting *Rhus Toxicodendron* and its allies, followed by critical descriptions, lists of specimens examined, tables of measurements and plates showing seed forms and leaf variations. One new form, *Rhus diversiloba* T. & G. f. *radicans*, is proposed, also 3 new combinations, *R. Toxicodendron* L. f. *radicans* (L.), *R. Toxicodendron* var. *eximia* (Greene), and *R. divaricata* (Greene). An attached correction-slip, dated April 6, 1925, changes the last mentioned to *R. Greenei* because of the existence of an earlier *R. divaricata.—Edith M. Vincent.*

9647. Maiden, J. H. **A critical revision of the genus Eucalyptus.** Vol. VII. Part 4. *P. 133–202. Pl. 260–263.* Alfred James Kent: Sydney, 1925.—The author continues the discussion on "The seed of Eucalyptus." Descriptions and illustrations of the seed of 75 selected species, representing several natural groups of species within the genus, are given. —*J. M. Greenman.*

9648. Palmer, Ernest J. **Synopsis of North American Crataegi.** Jour. Arnold Arboretum 6: 5–128. 1925.—Following a short introduction, this paper consists chiefly of an alphabetical enumeration of all published names of North American species and varieties of *Crataegus*, with places of publication. Under each recognized species and variety, the group to which the species belongs, the geographical distribution and the type locality are given. This enumeration is followed by a key to the groups, of which 21 are recognized, and by an arrangement of the species in groups; under each group the species are subdivided according to obvious floral and foliage characters into smaller divisions and the fruit of the species is described.—*Alfred Rehder.*

9649. Schwerin, Fritz von. **Revisio generis Sambucus.** [**Revision of the genus Sambucus.**] Mitteil. Deutsch. Dendrol. Ges. 29: 194–231. *6 fig.* 1920.—The morphological and anatomical characteristics of the genus *Sambucus* are discussed. The genus is divided into 7 sections and 26 species. The following new species, varieties, and forms are included: *Sambucus Ebulus* L. f. *angustifolia; S. nigra* L. f. *subintegra; S. mexicana* Presl f. *caudata; S. canadensis* L. var. *subglabra* f. typica, f. *repens* (*S. repens* Raf.), and var. *submollis* Rehder f. *rosicalyx; S. caerulea* Raf. var. *glabra* f. *fimbriata* (*S. fimbriata* Greene), f. *trifida* (*S. trifida* Heller), and var. *velutina* f. *vestita* (*S. vestita* Wooton & Standley) f. *semperflorens; S. Rehderana* from Texas; *S. orbiculata* Greene vars. *puberula* and *glabra; S. adnata* Wallich vars. *puberula* and *glabra; S. javanica* Reinwardt vars. *borealis, formosana* (*S. formosana* Nakai), and *meridionalis; S. racemosa* L. f. *versicolor*, f. *rosiflora;* and *S. callicarpa* Greene f. *typica* and f. *bicolor.—J. C. Th. Uphof.*

9650. Wilson, Ernest H. **The lilies of eastern Asia; a monograph.** *110 p. 17 pl.* Dulau & Co.: London, 1925.—In the 1st chapter the author describes the lilies of eastern Asia in their natural haunts where he himself had the opportunity to observe the larger part of them during his several expeditions to the Far East. Another chapter is devoted to the history of the genus, relating facts in regard to the discovery and introduction into cultivation of the more important species. The systematic part is preceded by a key to the subgenera, sections, and species, and consists of the description of 47 species with their varieties and hybrids. Under each species, literature and synonyms are fully cited, a complete description is given, and ample notes on the distribution, discovery, introduction, cultivation, and other interesting facts, are added. The following species, varieties, hybrids, and combinations are new: *Lilium longiflorum* f. *nobile*, var. *Alexandrae* (Bak.) f. *vittatum; L. japonicum* var. *album* (Hort); *L. Brownii* var. *colchesteri;* L. *myriophyllum* var. *superbum* (Bak.); × *L. princeps; L. leucanthum* var. *chloraster* (Bak.); *L. Bakerianum* var. *Delavayi* (Franch.); × *L. Parkmanii* var. *Haywardii; L. davuricum* var. *venustum* (Kunth), var. *venustum* f. *Batemanniae* (Hort. Wallace), f. *pardinum* (T. Moore), var. *Wallacei* (Wallace), subsp. *Thunbergianum* (Schult.) with several forms; *L. concolor* f. *sinicum* (Hook. f.), var. *pulchellum* f. *partheneion* (Sieb & Vriese), f. *coridion* (Sieb. & Vriese) and f. *okihime* (Hort.); *L. tsingtauense* var. *flavum* (Mak.); *L. ochraceum* var. *primulinum* (Bak.); *L. cathayanum; L. hyacinthinum;* and *L. macrophyllum* (D. Don). There are also the following new combinations of species excluded from the genus: *Nomocharis aperta* (Franch.), *N. Henrici* (Franch.), *N, nana* (Klotzsch), *N. oxypetala* (Bak.) and *N. aperta* (*Lilium oxypetalum* Franch., not Bak.).—*Alfred Rehder.*

FLORISTICS AND PLANT DISTRIBUTION

9651. Anonymous. **White Red-bud.** Missouri Bot. Gard. Bull. **10:** 110. *Pl. 12–13.* 1922.—*Cercis canadensis* L. var. *alba* Rehdr., having proved true to type, is illustrated and completely described.—*O. T. Wilson.*

9652. Billington, Cecil. **The flowering plants and ferns of Warren Woods, Berrien County, Michigan.** Papers Michigan Acad. Sci. **4:** 81–110. *Pl. 9–11. 1 map.* 1925.—Warren Woods, in Berrien County, Michigan, comprises about 100 acres of virigin hardwood forest contained in a plot of land set aside as a part of the Edward K. Warren Foundation. About half of the woods has been kept free from live stock so that it represents the original flora except for invading weeds and other plants that have followed in, on and along a wood road. The main portion consists of the climax forest of which sugar maple and beech are the dominant species. The trees are very large and the shade dense. A portion of the woods consists of the flood plain of the Galien River. This is also densely wooded, the more important species being cycamore, basswood, soft maple, red maple, butternut, hackberry and willow. Along the river are a few mud flats. The flora of the tract was studied in 3 different seasons of the year; 358 species and varieties of plants are listed, representing 203 genera and 79 families. The more important groups present were ferns, 17 species; grasses, 32; sedges, 42; Liliaceae, 17; Rosaceae, 16; and Compositae, 40.—*Ernst A. Bessey.*

9653. Bolzon, P. **Un lembo di terra istriana poco noto ai botanici italiani. [A part of Istria little known to Italian botanists.]** Nuovo Gior. Bot. Italiano n.s. **32:** 50–61. 1925.—This is a list of 257 species of plants, including varieties, and a 2nd of 40 species, collected in the islands of Cherso and Lussin, Istria, Italy, respectively. *Dianthus ciliatus* Gs. f. *conferta* from Cherso, and *Origanum humile* Mill. var. *purpurescens* Briq. subsp. *hispidum* from Lussin have not been described before. Several of these species are considered as new for the region, and others are new for the Adriatic Basin.—*P. D. Caldis.*

9654. Boros, A. **A husevö Aldrovanda ujabb hazai termöhelye. [New locality for Aldrovanda in Hungary.]** Természettudományi Közlöny [Budapest] **56:** 362–363. 1924.—The author collected *Aldrovanda* in Baláta Lake, near Somogyszob, in 1922.—*Istvan Györffy (translated).*

9655. Britton, N. L. **La vegetacion de cayo Icacos. [The vegetation of Icacos Key.]** Rev. Agric. Puerto Rico **12:** 91–96. *1 fig.* 1924.—A list is given of the flowering plants collected on Icacos Island off the coast of Porto Rico by N. L. Britton and party.—*John A. Stevenson.*

9656. Burleigh, Thos. D., and W. R. Mattoon. **A pocket manual of the common trees of Georgia.** Georgia State Coll. Agric. Bull. 291. *1–80. 78 fig.* 1923.—It contains descriptions of 78 of the more common forest trees found in the State of Georgia with cuts of their leaves, fruits and twigs.—*T. H. McHatton.*

9657. Chung, H. H. **A catalogue of trees and shrubs of China.** Mem. Sci. Soc. China [Shanghai] **1^1:** 1–271. 1924.—"So far as the author is aware, no previous attempt has been made to bring together all records of the ligneous flora of China . . . . the present work is limited to the Republic of China, especially China Proper. . . . . It gives the names of provinces whenever authentic records exist either in the form of a competent botanist's report or in the form of herbarium specimens. . . . . The present work aims to include only the described species. An exception is made only when the genus is recorded from the undetermined herbarium material or reported as an undertermined species. . . . . This work was carried out at the Arnold Arboretum. . . . . It is published with the hope that it will give students some idea of the vast number of species in the flora of China, a number certain to be increased with further exploration and study." The list is arranged by families beginning with the Cycadaceae and ending with the Compositae. A table summarizes the number of genera, species and varieties of each of the 134 families. In all there are 778 genera, 4840 species and 608 varieties included in the list. An index to families and genera is provided.—*Frederick V. Rand.*

9658. Craib, W. G. **Florae Siamensis enumeratio. A list of the plants known from Siam with records of their occurrence. Part I.** *8 vo. 198 p. 1 map.* Published under the auspices of the Siam Society. Printed by the Bangkok Times Press, Ltd.: Bangkok, March 5, 1925.—The present part includes the families from Ranunculaceae to Elaeocarpaceae inclusive, arranged in the sequence of Bentham and Hooker's Genera Plantarum. The scientific name of the species and its bibliography are given, followed by the occurrence of the species in Siam, its general distribution, and in many cases the local names. Notes are also frequently added. The following new varieties, and combinations are included: *Clematis smilacifolia* Wall. var. *grandifolia; Naravelia axillaris* Ridl. vars. *grandiflora, paniculata,* and *siamensis; Delphinium stapeliosmum* P. Bruhl. var. *siamense; Aromadendrum spongocarpum* (*Talauma spongocarpa* King); *Kadsura heteroclita* (*Uvaria heteroclita* Roxb.); *Desmos dubius* (*Unona dubia* Craib), *D. dumosus* Safford var. *glabrior; Oxymitra desmoides* (*Goniothalamus desmoides* Craib); *Miliusa mollis* Pierre var. *sparsior; Dactylicapnos scandens* Hutchinson var. *siamensis; Rinorea Curtisii* (*Alsodeia Curtisii* Ridl.), *R. dasycaula* (*A. dasycaula* Miq.), *R. heteroclita* (*Vareca heteroclita* Roxb.), *R. immersa* (*Alsodeia immersa* Craib), *R. lankawiensis* (*A. lankawiensis* Ridl.), *R. longiracemosa* (*A. longiracemosa* Kurz), *R. Murtonii* (*A. Murtonii* Craib), *R. pachycarpa* (*A. pachycarpa* King), *R. Scortechinii* (*A. Scortechinii* King), *R. Smithiae* (*A. Smithiae* Craib); *Hydnocarpus Kurzii* Warbg. var. *conica; Xanthophyllum affine* Korth. var. *puberulum; Hypericum Garrettii* Craib var. *ovatum; Ochrocarpus Harmandii* Pierre var. *brevipes; Eurya japonica* Thunb. var. *siamensis; Saurauja nudiflora* DC. var. *angustifolia; Camellia connata* (*Thea connata* Craib); *Dipterocarpus tuberculatus* Roxb. var. *grandifolius; Colona auriculata* (*Diplophractum auriculatum* Desf.), *C. Curtisii* (*Columbia Curtisii* Ridl.), *C. diptera* (*C. diptera* Ridl.), *C. flagrocarpa* var. *siamica* (*C. flagrocarpa* Clarke var. *siamica* Craib), *C. floribunda* (*C. floribunda* Kurz), and *C. Winitii* (*C. Winitii* Craib).—*J. M. Greenman.*

9659. Dodge, Faith Hunter. **Adventuring in the Andes in quest of a cactus.** Pan American Mag. **36**: 248–250. *Illus.* 1923.—This popular article is descriptive of an exploration trip in the highlands of Peru by Francis Macbride of the Field Museum, Chicago, Illinois. On this journey Macbride found a new species of cactus which was named *Borzicactus Fieldii* in honor of Marshall Field, founder of the Field Museum.—*H. N. Vinall.*

9660. Erlanson, Eileen Whitehead. **The flora of the Peninsula of Virginia.** Papers Michigan Acad. Sci. **4**^{1}: 115–182. 1925.—Collaborating with the late Earl Jerome Grimes, the author made extensive collection in that part of Virginia lying southeast of Richmond, which is bounded on the southwest by the James River, on the northeast by the York River Estuary, and on the east by Chesapeake Bay. This lies all within the Coastal plain. Included in the area are numerous typical pine barrens, as well as cypress swamps. This is the chief region in which Clayton made his collections. Very few collections have been made in this area since. A number of Clayton's forms were rediscovered, including a long missing Chelone, recently described as *C. Grimesii* Weatherby. The list of 1052 plants collected includes ferns, 26; grasses, 119; sedges, 70 (Carex, 33); Liliaceae, 24; Rosaceae, 40; Leguminosae, 60; Compositae, 137. The bibliography includes all the more important publications bearing upon the Virginian flora, beginning with John Banister, in 1688.—*Ernst A. Bessey.*

9661. Fitschen, Jost. **Zwei kritische Koniferen.** [Two critical conifers.] Mitteil. Deutsch. Dendrol. Ges. **31**: 225–227. 1921.—Critical notes are given on *Abies umbilicata* Mayr and *Picea hondoensis* Mayr.—*J. C. Th. Uphof.*

9662. Gates, F. C., and J. H. Ehlers. **An annotated list of the higher plants of the region of Douglas Lake, Michigan.** Papers Michigan Acad. Sci. **4**: 183–284. 1925.—The study of the flora of the vicinity of the University of Michigan Biological Station, at Douglas Lake, Cheboygan County, Michigan, began in 1909 and has been carried on by various persons since that time. A preliminary list was published in 1912. The locality covered by the list includes the portions of Cheboygan and Emmet Counties that lie adjacent to Douglas Lake and several smalls lakes lying near by. Besides these there have been included some plants found in these 2 counties but not yet recorded from the immediate vicinity of Douglas Lake. The list contains the names of 1,026 plants of which 921 belong to the Douglas Lake region. Among the more important groups represented are the following: ferns, 30; conifers, 12; Liliaceae, 22; sedges, 112 (*Carex* 85); grasses, 91; orchids, 34; Rosaceae (in the wider sense), 48;

Fabaceae, 19; Brassicaceae, 36; Compositae (in the wider sense), 111. A bibliography of 18 papers bearing on the flora of this region closes the paper.—*Ernst A. Bessey.*

9663. Grande, L. **Note di floristica. [Floristic notes.]** Nuovo Gior. Bot. Italiano n.s. **32:** 62–101. 1925.—The author lists 72 plants, with synonymy and other taxonomic notes, continuing his work from Ibid. **31:** 105–160. 1924. (See Bot. Abst. 14, Entry 3058.) *Agrostis capillaris* L. nomen ambiguum, confusum, obliviscendum. *A. vulgaris* With., *Avena versicolor* Vill., *A. pubescens* (*Trisetum pubescens* Huds.), *A. Ludoviciana* DR., *Petroselinum sativum* Hoffm., *Plantago alpina* L., *Polygonum alpinum* All., *P. arenarium* Wald. & Kit., *P. Persicaria* L. f. *incanum* Gr. & Godr. *Salix viminalis*, *Santolina rosmarinifolia* L., *Satureja Acinos* (L.) Scheele, *Solidago Virgaurea* var. *minuta* (L.), *Stachys alpina* L., *Trisetum carpaticum* R. & Sch. should be excluded from the flora of Naples. *Daphne Laureola* L. should be excluded from the flora of Sicily, and *Polygonum herniarioides* Del. from that of Italy. The following new combinations are made: *Pseudorlaya pumila* (L.) Grande (*Orlaya pumila* (L.) Halacsy, *Caucalis pumila* L.) and *Veronica acinifolia* L. var. *glabriuscula* (Ten.) Grande. —*P. D. Caldis.*

9664. Kozo-Poljanski, B. **Schedulae criticae I.** Ботанические Материалы Гербария Главного Ботанического Сада Р.С. ф. С.Р. [Notulae systematicae Herb. Hort. Bot. Petropolitani] **4:** 69–73. 1923.—In the forests of the Caucasus are often found plants resembling *Chaerophyllum aromaticum* L. They are often assigned to this species in literature and collections; but the author did not find any single example of the true *C. aromaticum* L. The plants which are generally confounded with it are *C. angelicaefolium* M.B., *C. Meyeri* Boiss. & Buhse, and *Anthriscus Schmalhauseni* K-Pol. The author gives a critique and the essential characters for their differentiation.—*V. Lashevsky.*

9665. Loesener, Th. **Über die Aquifoliaceen, besonders über Ilex. [The Aquifoliaceae, especially Ilex.]** Mitteil. Deutsch. Dendrol. Ges. **28:** 1–66. *4 pl.* 1919.—The uncertain relationship of *Ilex* toward other natural groups of species is discussed. The morphology and geographical distribution are given. Many species are described from a dendrological standpoint. Many details are devoted to the wild and cultivated forms of *Ilex aquifolium.*—*J. C. Th. Uphof.*

9666. Magnel, L. **Variétés observées en Belgique. [Varieties observed in Belgium.]** Bull. Soc. Roy. Bot. Belgique **57:** 59–74. 1924.—A long list of varieties of plants collected in Belgium and not represented in the "Prodrome de la Flore Belge" by Durand and De Wild. Most of them were determined according to Rouy in "Flora de France." This list does not contain the representatives of the genera *Rosa, Rubus, Mentha* and *Hieracium.*—*É. De Wildeman (translated by E. B. Payson).*

9667. Nohl. **Die Bambuseen auf der Insel Mainau. [The bamboos on the Island of Mainau.]** Mitteil. Deutsch. Dendrol. Ges. **29:** 75–77. 1920.—The writer enumerates 15 species of *Phyllostachys*, 9 *Arundinaria*, 2 *Sasa*, and 2 *Bambusa* which grow on the Island of Mainau.—*J. C. Th. Uphof.*

9668. Rodriguez, L. **Plantes de l'Albanie moyenne. [Plants from middle Albania.]** Bull. Mus. Hist. Nat. [Paris] **29:** 613–619. 1923.—This article lists about 140 species of plants collected from 1918 to 1920 by J. Boucart in central Albania. The families chiefly concerned are Ranunculaceae, Cruciferae, Caryophyllaceae, Geraniaceae, Leguminosae, and Rosaceae. —*John M. Fogg, Jr.*

9669. Teuscher, H. **Die sechs europäischen Arten der Gattung Tilia. [The six European species of the genus Tilia.]** Mitteil. Deutsch. Dendrol. Ges. **29:** 63–69. *2 fig.* 1920.—Six European species of *Tilia* are described. A dichotomous key, based on the characters of the leaves, is given.—*J. C. Th. Uphof.*

9670. [Troitskii, Ñ.] Троицкий, Н. **К флоре Центральнаго Закавказья. [The flora of the Central-Caucasus.]** Вестник Тифлисского Ботанического Сада Новая Серия. [Monitor Tiflis Bot. Gard. n. s.] **1:** 83–109. *Pl. 2–3.* 1922–1923.—The author gives the distribution of 54 rare species collected by him from 1917 to 1922. He also described the following new varieties and forms: *Medicago Dzhawakhetica* Bordz. var. *Timofeewii; Astrodaucus orientalis* (MB.) Drude var. *inermis* and f. *heterocarpa;* and *Betonica grandiflora* W. var. *albiflora* and f. *picta.*—*L. J. Pessin.*

9671. Uphof, J. C. Th. **Die Populus-Arten in Südwesten der Vereinigten Staaten von Nordamerika.** [Populus species from the southwestern U. S. A.] Mitteil. Deutsch. Dendrol. Ges. 32: 172–173. *2 pl., 1 fig.* 1922.—Descriptions are given of 15 species of *Populus* occurring in the southwestern section of the U. S. A., especially in Arizona, California, New Mexico, and Texas.—*J. C. Th. Uphof.*

9672. White, C. T. **The eucalypts or gum trees of the Brisbane District.** Queensland Nat. **4**: 109–112. *2 pl.* 1924.—Descriptions, distribution and notes on the timber of *Eucalyptus saligna* Smith and *E. tesselaris* F. v. M. are given. The appearance of the trees in the field is illustrated by photographs.—*W. D. Francis.*

9673. White, C. T. **The eucalypts or gum trees of the Brisbane District.** Queensland Nat. **5**: 12–16. *2 Pl.* 1925.—Descriptions, distribution and notes on the timber of *Eucalyptus ma culata* Hook. and *E. micrantha* DC. are given. The appearance of the trees in the field isillustrated by photographs.—*W. D. Francis.*

9674. Wierdak, Sz. **O zielonokwiatowym zimowicie, Colchicum autumnale L. var. vernum Rchb. lusus viridiflorum Kruber. [Greenflowering Colchicum autumnale L. var. vernum Rchb. lusus viridiflorum Kruber.]** Acta Soc. Bot. Poloniae **2**: 265–268. 1924–1925.—The author has found near Przeworsk, Poland, a variety of *Colchicum autumnale* with green perianth. It flowers in May. This is the 2nd station in Poland for that rare plant; the 1st station is in the Kolomyja district.—*H. Czeczott.*

MISCELLANEOUS, UNCLASSIFIED PUBLICATIONS

Sam F. Trelease, *Editor*

9675. Anonymous. **Hats from plants.** Missouri Bot. Gard. Bull. **8**: 113–116. *Pl. 13.* 1920.

9676. Anonymous. **The Daniel Boone judgment tree.** Missouri Bot. Gard. Bull. **10**: 25–26. *Pl. 4–5.* 1922.—An expedition from the Garden has located this tree on the old Boone homestead at Darst's Bottom, Femme Osage, Missouri. The tree is an American elm (*Ulmus americana*).—*O. T. Wilson.*

9677. Anonymous. **The fifth Washington meeting of the American Association for the Advancement of Science.** Nature **115**: 586–587. 1925.

9678. Csekey, Stephan v. **Die Organesierung wissenschaftlicher Auslandsinstitute. [Organization of foreign scientific institutions.]** Minerva-Zeitschr. **1**: 95–101. 1925.

9679. Green, Glenn. **Paraffin rings on microscopic slides.** Amer. Jour. Public Health **15**: 651–652. *1 fig.* 1925.—A tool is described for making paraffin rings to be used in place of a grease pencil on slides for agglutination work. It consists of a heavy nichrome wire with one end bent into a circle about 16 mm. in diameter and the other end attached to a handle. The plane of the circle should be at right angles to the handle and the wire of the circle is wrapped with thread. In use the circle is dipped into smoking hot paraffin, "then placed lightly but securely on a dry slide, withdrawn quickly, and the paraffin allowed to cool."—*C. A. Ludwig.*

9680. Koch, Herbert. **Der Deutsche Wissenschaftliche Verein in Buenos Aires. [The German Scientific Association in Buenos Aires.]** Minerva-Zeitschr. **1**: 113–115. 1925.

9681. Krausse, Anton. **Die Biologische Station der Königlichen Universität Cagliari, Sardinien. [The Biological Station of the Royal University of Cagliari, Sardinia.]** Minerva-Zeitschr. **1**: 101–102. 1925.

9682. Millspaugh, Charles F. **Herbarium organization.** Field Mus. Nat. Hist. Publ. 229, Mus. Tech. Ser. 1. *1–18. Fig. 1–9.* 1925.—An account is given of the system of herbarium organization developed by the author in the Field Museum of Natural History. The manner of recording new accessions is explained. The herbarium catalogue, index of collectors and geographic index maintained in the herbarium of the Field Museum are discussed and illustrated by facsimiles of the blanks and forms employed. Herbarium cases, herbarium arrangement and herbarium rules are treated briefly, also the Museum's method of handling loans.—*Edith M. Vincent.*

9683. Moldenhauer, Gerhard. **Der Stand der Wissenschaften in Portugal. [Condition of the sciences in Portugal.]** Minerva-Zeitschr. **1**: 90–93. 1925.

9684. Pitman, Evadel M. **Wonderland indoors.** Maine Nat. **5**: 96–98. 1925.—This describes winter botanizing and bird-hunting in a museum.—*C. A. Weatherby.*

9685. Russel, J. C., and E. G. Jones. **Two new soil thermometers.** Jour. Amer. Soc. Agron. **17**: 93–99. 1925.—A metal thermometer and a glycerin thermometer are fully described.—*F. M. Schertz.*

9686. Swenarton, Joseph C. **A simple method for cleaning used microscopic slides.** Amer. Jour. Public Health **15**: 651. 1925.—The crude disinfectant sold under the name "Kreso Dip" will dissolve vaseline and cedar oil and remove stains. To clean slides soiled with either of these materials it is only necessary to allow them to remain in a 5% solution for about 5 hours and then to rinse in water.—*C. A. Ludwig.*

ERRATA, VOLUME 14

Australian Sugar Jour. **16**: *not* Australian Sugar Jour. **26**. Entry 7395.

Bogue, Robert Herman, *not* Bogue, Herman Robert. 3787.

Börgesen, F. (Translated from the Danish by Fred MacFarlane), *not* Börgesen, F. C. E. 1280.

Bouly de Lesdain, A monograph by, *not* M. de Lesdain. 1625.

Champlin, *not* Chaplin. 4982.

Duly, S. J., *not* Duly, J. S. 3995.

Dunshee, C. F., *not* Dunshee, D. F. 32.

Fargo, North Dakota, *not* Willmar, Minnesota. 2377.

Goeze, *not* Golze. 7216.

González Fragoso, R., *not* González, Fragoso R. 3632.

Killian, *not* Kilian. 4517.

Комаров, В. Л. [KOMAROV, V. L.] **Достижения в области,** *not* Комаровым, В. Л., и Достижения [KOMAROVYM, V. L., AND DOSTIZHENIJA]. 4869.

Linen Indust. Res. Assoc. *not* British Cotton Indust. Res. 6388, 6389, 6843.

Onodera, I., *not* Onodera, L. 896.

Russell, E. John, *not* Russell, C. John. 5034.

Tavares, J. da S., *not* Tavares, J. S. 3906.

$\frac{\text{Area 1}}{\text{Area 2}} = \frac{\text{Species } 1^n}{\text{Species 2}}$, *not* $\frac{\text{Area}}{\text{Area}} = \frac{\text{Species } 1^n}{\text{Species 2}}$. 6187.

". . . soaking for 1 hour in a 0.1 per cent solution of salicylic acid," *not* "soaking for 1 hour in a 1 per cent solution of salicylic acid." 399.

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Published by the

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